Archive

The Subscription Magazine for Acorn Users

APRIL '97

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April 1997 Vol. 10 N° 7

Creating Web Pages

StrongARM Tests

Starting StrongED

Astra Satellite Television

Basic and Assembler Hints

REVIEWS: Map Edit and OS Import,
Scrabble on the Pocket Book,
Sega & Gameboy Emulators, StrongARM Clock,
Ultimate Human Body CD

ncs

NORWICH COMPUTER SERVICES

Acorn's turnaround continues

Acorn's full year figures show "a reduction in operating losses, before exceptional items, from £10.4m in 1995 to £2.5m in 1996". You may say "they've still lost over two million pounds!", but to have increased profitability (well, all right, reduced loss-ability!) by £8m in **one year** on a turnover of £30m, is quite substantial. I'd certainly like to increase my profitability by 26% in one year! Well done, Acorn! The Stock Market obviously approve as Acorn's shares rose by 17 points (9%) last week. + 5% MONDAY!

You may also be interested to hear that ARM Holdings Ltd nearly doubled their turnover in 1996 (73% increase), and made pre-tax profits of £3.7m on a turnover of £16.7m, i.e. 22% profit. Nice one, ARM!

Club revival?

The other positive sign this month is the seeming increase in user-group activity. I'm pretty sure that this is a direct result of the StrongARM's incredible power. Old established clubs like the Wakefield group are going from strength to strength – their show in May is **two days** this year – and a number of new groups are starting up in various parts of the UK – see the Club News on page 30. If you are starting a new club, or reviving an old one, or would like someone to start up a club in your area, do get in touch with us.

And the interest is not just in the UK. We've just checked our subscriptions database and found that Archive goes out to 32 different countries around the world!

Hope you enjoy the mag – it's stuffed full again this month and there are about a dozen reviews waiting to be published but there's no space for them.

Fun times, eh?!

Paul Beverley

The following information is about the Christian faith, not specifically about computing.

I have been accused by one of my correspondents of "talking up a revival". I think that referred to my references to the numbers of people in the UK going on Alpha courses. Well, OK, I do tend to "accentuate the positive" – for example, in my editorial above, I didn't bother to mention that Acorn *still* haven't released the NetStation as they have problems with programming the smart cards. I don't want us to be unrealistic about the problems, but where there are good things happening, why not let people know about them?

Is there a Christian revival going on in the UK? Is there one coming? I wish I knew! And I wonder what image readers outside the UK have of us? Do you think we are a Christian country? Here are a few statistics for you to think about. (Set the figures against the population of the UK being about 50 million.)

Between 1980 and 1990, half a million people *left* the Church of England (the largest denomination), and there was a similar decline in other denominations. There are 30,000 Christian clergy in Britain, but there are 80,000 registered fortune tellers and witches. Every *day* in Britain, 480 couples are divorced, 170 babies are born to teenage mothers and 470 babies are aborted – that's every *day*. A new crime is committed every six seconds and a violent attack takes place every two minutes.

Yes, I know, "There are lies, damned lies and statistics", but my own personal view, for what it's worth, is that the UK is sliding towards moral and spiritual bankruptcy. We used to be a Christian country, and the majority of our laws are based on Christian morality, yet things seem to be getting worse, not better. The good news, in one sense, is that people are beginning to realise that there is a moral slide and are reacting to it, but moral slides are caused basically by selfishness, and laws cannot change the human heart – only God can do that.

To me, there is a ray of hope – some people are waking up to see that, just because Christianity is "old" doesn't automatically disqualify it. One way for you to find out for yourself is to go on an Alpha course – around 250,000 did in 1996, and the guestimate for 1997 is half a million – one in ten of the UK population! *P.B.*

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Products Available

Acorn's StrongARM RiscPC – Once stocks of ARM710 RiscPCs are sold out, they will be replaced by the new StrongARM-ready RiscPCs. The ACB 75/76 10Mb RiscPCs have already been sold out and therefore they are replaced by the **SRP05** which is 10Mb (8Mb SIMM plus 2Mb VRAM), 1Gb hard drive, 200 MHz StrongARM at £1450 inc VAT and the **SRP06** which is the same as the SRP05 but with an eight-speed CD drive for just £50 extra: £1500 inc VAT.

All About Handwriting & All About Planes CD-ROM – Christopher Jarman is one of Britain's leading handwriting gurus, whose books for teachers and children are bestsellers around the world. He has teamed up with software publishers Topologika to produce a CD-ROM which contains not just one but two titles:

All About Handwriting provides computer-based handwriting resources for primary and secondary phases. Topics include: Handwriting Skills, The Story of the ABC, How To Make Ink & Quill Pens, Things to Try in the Classroom, Illuminated Letters and Writing Surfaces. All About Handwriting will encourage children to form their letters correctly and take a pride in their work, enhance History and communications topic work and develop Handwriting INSET. It also includes 'joins', an easy-to-use animated program to demonstrate how to write and join any letter, phrase or sentence.

Archive Monthly Disc – £2

(Now on 1.6Mb, but available as two 800Kb discs if you ask specifically.)

- Arcscan data files prepared by Eric Ayers – Updates for volume 10.
- ModemDial program from Andrew Berry – see Archive 10.5 p5.
- TBAFS read-only version from Anthony Brion – relates to a so-far-unpublished review article.
- Electronic clippings – hot news from Acorn Cybervillage and elsewhere
- !WTB patch from Andrew Clover for RISC OS 3.7.
- Dr Wimp program from Ray Favre – page 37.
- Items from Dave Floyd's Printing Column – page 47.
- Gameboy and Sega emulators sent in by Dave Floyd – page 61.
- !pdf document reader from Leo Smiers sent in by Dave Floyd – page 51.
- Font Tables from Jonathan Frankl – page 19.
- Files from Gerald Fitton's Column – page 62.
- Dave Thomas's !Makro and Stuart Halliday's Sendtext sent in by Bob Harding – page 20.
- Assembly Language Programming from Chris Johnson – page 73.
- DrawGen programs from Jim Lesurf – page 77.
- Roger Lynn's FileAccessLED module – uses the scroll lock light to show disc access.
- Astra satellite info from Colin Sutton – page 21.
- PB II programs sent in by John Woodthorpe – see the Pocket Book Column, page 26.

These files are also available on Norwich Computer Services' own web site: www.paston.co.uk/ncs

RiscPC prices falling or rising?!

After last month's **drop in RiscPC pricing**, we now have a price **rise** in the offing – but not caused by Acorn. There are various factors coming together which are threatening to produce a **dramatic increase in the price of SIMMs** over the next few weeks. There has been talk of 50% increases, and some suppliers are even saying they think that the price will double, but we suspect that's deliberate scare-mongering for commercial gain.

We will obviously have to raise our SIMM prices in line with the market. However, until the SIMMs we have in stock run out, we will **reserve the lower price SIMMs for people buying RiscPCs**. If you just want to buy SIMMs to upgrade an existing computer, I'm afraid that they will have to be at the new, higher prices.

I hope you don't feel that is unfair, but having given people encouragement last month to buy RiscPCs at the new lower prices, we didn't want to discourage them this month by hiking up the SIMM prices.

We don't yet have any exact new pricing, but if it comes through before the Price List has to go to the printers, we'll put more details in there.

All About Planes targets reluctant readers from Key Stage 2 and up. From Icarus to the Space Shuttle, from How Planes Fly to websites to visit, Planes is designed to get kids reading. Planes has been structured like a book so that students will find it easy to use and develop those all important transferable skills. Each page has an illustration/animation with text which can be spoken by the computer. There are plenty of activities, including making paper aeroplanes, pictures to print and colour – there's even a section to help plan school trips. Topics covered include: Early Planes, Air Flow, Passenger Planes, Helicopters, Birds & Gliders, Military Planes, Cockpits, Fun Planes, and Things To Do, including a multi-choice 'Pilot's Exam'. Students can easily export text and pictures for inclusion in their own work.

The CD-ROM costs £35 +VAT from Topologika (or £39 through Archive), with a network licence available at double the cost, and the extra discs are £15 +VAT each.

Autosheet – See Archive 10.6 p38 for the review of Autosheet. In the meantime, there are a couple of changes to mention. Firstly, the email and WWW addresses have changed. Alisdair McDiarmid can now be contacted at: alisdair@verisimilitude.demon.co.uk, and his web pages are at http://www.verisimilitude.demon.co.uk/alisdair/

Secondly, the licence has changed. The difference now is that the £5 student licence has been removed, leaving the Teacher and School licences as before.

BitFolio 7 CD – This clipart CD got a good write-up a year ago (9.6 p9) as "If you only ever buy one clipart collection, this is probably the one to buy". The reviewer made that comment when the price was £95. We managed to do a special deal with BitFolio and sold large numbers at the special price of £75. BitFolio have now dropped the price, making it £49 inclusive through Archive – virtually half price.

Canon BJC4550 – If you are wanting an A3 colour printer then the new BJC4550 offers the larger size format at 720×360 resolution for only £400 through Archive. *(Drivers currently only for 360×360.)*

CD-ROM drives from Eesox – The BronzeII 4×4 is an auto-changer CD-ROM where up to four discs can be loaded into the mechanism, and each is given its own CD-ROM drive icon on the iconbar. The drive will automatically change between the discs, taking approximately 5 seconds to do so. Even though it can hold four CD-ROMs, it still only takes up as much space as a standard CD-ROM

drive. It's a 4-speed drive with an average seek time of 220ms. Loading is by direct insertion and it can operate vertically.

The BronzeII ×8 speed CD drive is the flagship model for those demanding top performance from their CD-ROMs. Not only does it deliver data quickly, it also supports the more unusual features, such as CD volume control, and the ability to transfer audio CDs digitally to hard disc. It's an 8-speed drive with an average seek time 120ms. Loading is by tray and it can operate vertically.

Both of the Bronze drives work with the PC card, and are PhotoCD and Multi-session compatible. Their connections are: printer pass-through port, headphone socket, audio left/right line out.

The BronzeII 4×4 costs £169 +p&p +VAT, or £200 through Archive. The BronzeII ×8 costs £189 +p&p +VAT, or £230 through Archive.

CD-ROM prices down – Continuing the trend of speeds going up and prices coming down, we can now supply a **twelve**-speed IDE drive for £145 and **twelve**-speed SCSI drive for £175 (internal) or £235 (external). If you are wanting multiple CDs, for situations where waiting for CDs to change is not acceptable, e.g. in a school, the CD-tower is the answer. We can supply a tower with six six-speed CD-ROM drives all in one block for £1090. These are all Eesox drives.

CoPS is a psychometric testing system for 4–8 year olds. Each child tested with CoPS is run through a series of nine tests, each of which tests one or more cognitive skills such as visual sequential memory. Each test takes about ten minutes, which must be undisturbed, but the tests do not all have to be taken on the same day. CoPS assesses visual and auditory/verbal associative memory, visual and auditory/verbal sequential memory, visual-verbal associative learning, phonological awareness and auditory discrimination. It also indirectly measures information and motor processing speeds. This gives a profile of the child's cognitive abilities. One of the tests, Zoid's Friends, tests visual sequential memory (temporal/colour) by showing a sequence of differently coloured aliens. The child must then click on coloured boxes to indicate the order. If they find this difficult, they may have difficulty with verbal encoding, look-and-say reading methods, spelling or writing.

CoPS is available from Chameleon Assessment Techniques Ltd for £350 +VAT. Leasing is also available through Chameleon.

DataFrame is a new way of handling data from Resource. DataFrame stores information in a way which is clear and immediately understandable, by combining the most useful aspects of a database and a spreadsheet. You enter the data by typing it into the appropriate row or column – want an average or a total? Two clicks and it's done! A pie or bar graph? Two clicks and there it is! You can search for names or values, make calculations, sort, change grid size and more, but always in a clear, intuitive way. DataFrame will handle very simple material at Key Stage 1 but is flexible enough to cover data handling requirements through to Key Stage 3.

DataFrame comes with sample files at different levels, and costs £30 +p&p +VAT from Resource.

Disc Doctor – There is a new version of Disc Doctor, able to handle large hard drives formatted with the HForm Beta. There is a *free* upgrade for all registered users. Disc Doctor is a commercial development of the FSCK disc repair system. It is able to perform all the functions of FSCK, whilst providing the user with a simple to use RISC OS front end, which means no more messing with command line parameters. In addition, the suite provides a simple and effective solution to recovering accidentally deleted files, repairing broken directories and repairing faulty disc maps.

Among the suite of programs is: **Resurrect** an application which is able to undelete files, or even whole directories of files which have been inadvertently deleted. A list of previously deleted files, may be presented at any time, perhaps even dating back several weeks, then undeleted by dragging them back to a filer window. **DiscAid** is an application which is able to check and repair commonly occurring problems with either floppy or hard discs, including broken directories and faulty disc maps. **MapView** is an application which is able to display the map of a disc in a graphical manner. This is useful to analyse how a file or directory is stored on the disc surface, or to examine how much of the free disc space is fragmented.

Disc Doctor costs £29.95 fully inclusive or £29 through Archive.

Budget Starter RiscPC

If you just want to get started for the minimum possible amount of money, and have an old computer for trade-in, we'll do a very special price package:

9Mb/540Mb RiscPC (no monitor) – £895

9Mb/540Mb RiscPC + AKF60 – £1159

This is an ACB64 (while stocks last) with two 4Mb SIMMs, plus a second hand 1Mb VRAM. These will have ARM710 processors, but when stocks have finished, there will only be StrongARM RiscPCs which will cost about £115 more than the 710 equivalents.

*N.B. This is for **Clan members only** and includes a trade-in of an old computer – anything will do, except BBC Computers or Sinclairs.*

EFF free CD-ROM with 4000 PD Fonts. The Electronic Font Foundry believes that Public Domain fonts should not be sold by anyone, since their authors have made them available to the public for free. This was a reason why EFF has launched this collection of Public Domain fonts, and what's more decided to supply them free of charge. In order to make these fonts useful for Acorn computer users, the EFF has added hinting and skeletons to every font – they are not made to the exacting standards they apply to their own fonts, but they do make them more usable at any point size no matter how small. EFF say that they use an improved, No Dropout Technology method of hinting and that these fonts benefit significantly, compared to other Public Domain fonts. That's not to say that these fonts compare with EFF's own collection – they are still PD fonts!

Applications on the CD include: **!PDcat** an on-line catalogue of all the fonts – it shows samples of the fonts at any point size between 12 and 72, and also has a search facility and a Font Installer which makes an installed font available to any application immediately without a need to reset the computer. **!EFFcat** is an on-line catalogue of the professional fonts from the Electronic Font Foundry – it shows samples of their fonts in the various languages they cater for. This application can also search for the EFF font names or their PostScript equivalents.

If you are ordering anything from the EFF, the CD-ROM is completely free of charge, otherwise they require a self-addressed label and their standard handling charge of £1.50 in Post Office stamps or a cheque for £2.05.

Frank and the Kilowatts CD is an interactive safety game aimed at conveying important safety messages to young people that could save them from serious injury or death. It's a fun, graphical adventure game featuring the 'Creature Comforts' characters. It shows children how to avoid the most common hazards involving electricity, and shows how electricity is generated and distributed. Safety messages featured: Water and electricity don't mix, the importance of using circuit breakers, never play near a substation, never retrieve an object from power lines, pylons or substations, using the right fuse, playing in disused buildings, safety in the home, and the dangers of low-level power lines.

Comprehensive teachers' notes with step-by-step instructions on how to install and use the game are included. It requires 2Mb of RAM, 5Mb of hard disc space, CD-ROM drive and RISC OS 3.1 or greater. It's aimed at Key Stage 2 to 3, and is relevant to Science and Information Technology.

To education, the cost is £5, but for non-education users the cost is £15 +VAT from an organisation called Understanding Electricity.

HardCash – RaspSoft have announced the release of HardCash 50 *(see Products Available 10.6 p5 for the original notice)* – the 'ultimate' payroll system for the Acorn platform. A working demo can be downloaded from their website at: http://www.argonet.co.uk/users/s.dine

HardCash costs £99 from RaspSoft, but they are doing a special price, until 30th April 1997, of £89.

Internet software – Looking for any Internet software? The "definitive collection" of free Acorn internet software on the web has been compiled and is available at:

http://www.infopark.demon.co.uk/freenet/

Authors tend to keep the latest version of their software on their home web pages, and so this is the first place you should check.

Maltron ergonomic keyboards – The successful range of Maltron ergonomic keyboards has just been extended with the introduction of the Maltron Expanded keyboard. This Expanded keyboard has been developed to enable those with muscular control problems and those with visual problems to access a computer.

The expanded face presents a series of square holes with the key mechanism underneath a steel shell. All the operator has to do is press through the 18×18mm hole to hit the exact key required. And the problem of multiple characters being produced by a single yet elongated press is solved by allowing the Typermatic repeat rate to be easily changed at the keyboard. An off condition and three different speeds can also be selected.

This new Maltron Expanded keyboard suits IBM AT and PS/2 computers, (this includes the RiscPC), and the manufacturers are currently producing a version for use with the A4000 & A5000 machines. The nylon coated steel case with integral key guard provides an easily cleaned surface and longevity in a physically demanding environment. The keyboard is supplied with a standard cable and adaptor so that it suits 5-pin and 6-pin socket systems. An integral switchbox in the expanded keyboard enables a standard keyboard to be plugged in which is most useful for teachers and carers etc.

Two letter layouts are supplied with each keyboard. These are the standard QWERTY layout, which suits those with some typing experience, and an ABC arrangement. An LED light shows which letter layout is being used.

The Maltron Expanded keyboard is available from PCD Maltron and costs £545 +VAT.

Oak Recorder 3 Plus – With the power of the RiscPC in mind, Solent Computer Products have produced a new version of their Oak Recorder sound sampling system: the Oak Recorder 3 Plus. This has been re-engineered to achieve higher quality in two ways: A wider dynamic range for greater sensitivity is produced and higher recording rates up to 40kHz can now be achieved.

The Oak Recorder 3 Plus supersedes the Oak Recorder 3 in production at no extra cost. The price remains fixed at £44.95 +p&p +VAT, or £52 through Archive. To education it costs £39.95 +p&p +VAT.

Hardware upgrades are available to existing Recorder 3 users for just £12.95 + VAT. Contact Solent for further details.

!Pdf is an Adobe® Portable Document Format file viewer for RISC OS. Although !pdf is based on version 0.6 of xpdf, it does not support all the features of xpdf. The following extra features are supported though: Zoom, and Save as drawfile (use Draw for printing your page). To use !pdf, you need the following resources: Acorn toolbox modules and 2Mb RAM. !pdf has been tested on an Archimedes 310/4 Mb, RISC OS 3.1, with FPA, and StrongARM RiscPC/20 Mb, RISC OS 3.7.

!pdf is available for download from the Knoware website: http://www.knoware.nl/users/lsmiers/index.html and is based on the program xpdf from Derek Noonburg (<derekn@ece.cmu.edu>). *(It's also on this month's program disc. Ed.)*

PDSview – Designed for image processing in True, False and Pseudo colour on large binary data arrays, such as satellite and spacecraft remotely sensed data, PDSview has also taken on a new lease of life with the StrongARM version. Now that vast amounts of Spacecraft data are available via the internet, the need for an image processing package specifically designed for the analysis and enhancement of these images, is greater than ever.

PDSview costs £116.91 inclusive from Spacetech or £110 through Archive.

RamDisc+ is a management utility for your RAM disc. By clicking on its icon on the iconbar, the RAM disc's size can be increased or decreased by an amount equal to your computer's page size. For those

No more ARM710 RiscPCs!!!

Please read this carefully – it is a very significant announcement...

Once existing stocks of ARM710 RiscPCs are sold out, **all** RiscPCs will have **StrongARM as standard**, at about £115 more than the ARM710 equivalent.

If Acorn is to stay in the desktop PC market at all, it needs to have a machine that is at least as powerful as its Pentium rivals – that means StrongARM. They have therefore decided to try to gently encourage developers to move into the StrongARM generation by refusing to sell non-StrongARM computers! (The A7000 will continue to be marketed, mainly with schools in mind.)

with Access+ networks, options to share the disc, just like those for other drives, are also provided. For those utilising the RAM disc when copying files to floppy disc, options are provided to set the size of the RAM disc to one of many common disc sizes. Dropping objects onto the RamDisc+ icon will place the object in the RAM disc; such objects can be dragged from directory displays or even an application's Save window. Underneath the icon on the iconbar, the RAM disc's free space is constantly displayed. At the click of a button, all the files in the RAM disc can be moved or copied into a directory on a fixed disc of your choice, deleted or closed. Options are also provided to set the RAM disc as the location for scrap files and as the currently selected directory (CSD).

RamDisc+ from Cherisha Software costs £10 (no VAT) for a single user licence. An unlimited licence costs £45.

Recall – Have you ever quit an application only to need it again a short time later? Recall is an application that stores details of all the applications run on your computer since Recall itself was started. At the click of a button, an application long since quit can be re-launched. As each application is quit, its name will be added to the Recall submenu on the iconbar menu. By clicking on the required application's menu entry, the application in question can be re-launched.

Recall from Cherisha Software, costs £4 (no VAT) for a single user licence. An unlimited licence costs £12.

Safety First from the Understanding Electricity Educational Service, covers safety issues, simple circuits and the role of fuses in electrical appliances. The **Simple Circuit** program allows pupils to build their own circuits; it also introduces the concepts of conductors, insulators and electrical circuits before pupils move onto practical, experimental work. The **Fuses** program simulates the fitting of fuses to six domestic appliances and shows the dangers of fitting a fuse with an incorrect rating. The **Safety Game** takes pupils around a house; players score points for correctly identifying potential electrical hazards at different locations in and around the home. It's aimed at Key Stage 2 to 3 with curriculum relevance to Science, Technology and Information Technology.

Safety First is available from Understanding Electricity, and costs £5 for education and £15 +VAT for non-educational users. *(Despite the similarities, this is not the same product as Frank and the Kilowatt CD. It confused me! Ed.) (Not difficult!!)*

Sportster modems – The range of Sportster modems has extended, and the prices have dropped. The 14.4Kbaud is now £110, the 33.6Kbaud is £180 and there is now a 56Kbaud modem at £220. This new modem technology from US Robotics is the first Sportster modem to have flash memory and it enables Internet and On-line connections at nearly twice the speed of those currently available over standard telephone lines.

In addition to the flash upgrade capability, the new Sportster has all of the user features of the current Sportster Voice 33.6. These include fax, personal voice mail with multiple mailboxes, hands-free speakerphone, remote voice message and fax retrieval, and fax-on-demand. To use the voice features, including the hands-free telephone function,

requires the addition of a headset, a powered speaker or a soundcard.

The modem is supplied with fax, data and voice communications software for PC, and free trial offers to Virgin Net, NETCOM (both exclusive to US Robotics), AOL and Compusrve. It also carries a five year warranty and free lifetime support.

How, you are asking, can a company claim to get 56Kbaud data transfer on a standard telephone cable? On your behalf, I asked the salesman(!) and he claimed that it's a new technology that many of the big ISPs have adopted/are adopting (he mentioned Pipex, AOL, Compuserve, Netcom and Virgin), which allows 56Kbaud from the ISP to your computer, although you are still limited to 33.6Kbaud in the other direction. Before buying the "Flash X2" modems, as they are called, I suggest you check with your ISP! (If anyone has any further information and/or can explain it to a confused editor, it would be much appreciated!)

Talking Rhymes 2 – Topologika now have two Acorn RISC OS titles in the Talking Rhymes series. Pack 2 follows the success of the first Talking Rhymes release and contains: Mary Mary Quite Contrary, Baa Baa Black Sheep, Jack and Jill and Twinkle Twinkle Little Star.

Topologika's Talking Nursery Rhymes give reading software a new twist. Children are presented with jumbled up bits of a rhyme as a picture and/or words. When they've got it un-jumbled, the computer speaks the rhyme and plays an animation with a sing-along tune. And that's not all – when the child clicks on a piece of the puzzle, the computer speaks that part of the rhyme. It's a real human voice, so children have no difficulty understanding it.

Buttons help with reassembling the rhyme and managing the program: a 'cheat' button shows how the rhyme will look when it's finished, and an ear button reads the rhyme as it currently is – no matter what the order of the words! Screens can be configured to present the child with lines, columns or just words, so the same task can be re-presented with higher levels of difficulty. These 'talking jigsaws' have tremendous potential for young children who love the detail and humour in the animations; they can even play them backwards! The pack includes a manual full of suggestions for work away from the computer.

Pack 1 contains Humpty Dumpty, Georgie Porgie, Little Jack Horner and Miss Muffet.

Pack 2 contains Mary Mary Quite Contrary, Baa Baa Black Sheep, Jack and Jill and Twinkle Twinkle Little Star.

The packs cost £25 +VAT each or £40 for both. Site licences cost twice those prices. Owners of Version 1 of Pack 1 can get a free upgrade – just send your original discs back to Topologika at their new address. Through Archive, Packs 1 & 2 cost £29 each or £45 for the two.

Teletext Plus – Octopus Systems have recently released v6.5 of their Teletext+ application (reviewed in Archive 9.7 p57), and an upgrade can be obtained by returning your master disc to them with a cheque for £12 to cover the cost of the upgrade, a printed supplement, VAT, postage and packing. Registered users can also obtain the upgrade from Octopus Systems by email at no charge.

The upgrade offers full compatibility with StrongARM and with Irlam Instruments' Risc TV package. The latter has its own teletext add-on option but the built-in software control facilities are relatively basic. Using the Teletext+ software instead affords all the extensive facilities covered in the review, and more. The Risc TV application does not need to be pre-loaded because starting Teletext+ automatically extracts the necessary support module data from the Risc TV.

The update now allows sub-pages to be rolled automatically, has the ability to load teletext files saved from Design IT or Computer Concepts teletext software, allows telephone numbers in teletext pages to be dialled using DTMF tones through the computer's sound system, and has a new alarm facility, improved choices and keyword searching options.

The Games Suite version 2 – After much work, the Games Suite version 2.00 is now available. The new version is a completely new product – not much of the original remains, hence it has been named v2.00. For those who have not encountered The Games Suite before, it is a complete games development tool kit. The system assumes no prior knowledge, and can be used on two levels: either by those who are competent coders, and just require

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THE NETHERLANDS

SATURDAY 31 MAY
10.00 a.m. to 5.00 p.m

Acorn
LANDELIJKE DAG VOOR GEBRUIKERS VAN ACORN COMPUTERS
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http://www.nedernet.nl/~bigben
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BIG BEN CLUB

the use of the specialist games library routines, or by those with little or no programming experience. The routines are all produced in 100% ARM code, and will handle: collision detection, sprite plotting, animating and moving objects, handling their interactions with other objects, etc.

The multitasking environment editor and macro language will let you in gently to the world of games programming, with an easy-to-use program and step-by-step manual. Upgrades will be continually available for a nominal handling fee, by post for versions 2.00 to 2.09, after which an upgrade fee will be charged. Free upgrades will be dispatched to all users of v1.00 upgrading them to v2.00. For full details and a free demo, point your browser to: http://users.ox.ac.uk/~sjoh0576

The Games Suite is available for £25 inclusive from Grasshopper Software.

The Ultimate Human Body CD

(TUHB) is the latest product from Innovative Media Solutions – a company which specializes in developing software to allow some of the best IBM PC CD-ROM titles to operate on the Acorn platform. TUHB has been produced in conjunction with Dorling Kindersley (DK), the company which developed the CD for the IBM PC. For each of their products, IMS has written a reader program that is very specific for that CD-ROM. The reader takes all the data from the CD – the graphics, text, speech, music, animations and videos – and translates it into a RISC OS application. All this happens transparently, behind the scenes, as you use the program. All you need to do is double-click on the reader (just like any other RISC OS program) and you now have a native version of the CD-ROM software to explore.

TUHB costs £38 +p&p +VAT, or £45 through Archive. (See the review on page 25.)

!TMViewer is a PD VRML browser from the authors of TopModel and is available for free download at: http://www.hornby.demon.co.uk/freeware/index.htm

!TMViewer is basically a 3D viewer which accepts files in TopModel binary format (&B5C 3DFiles and &139 3DScenes) and VRML files (with a good integration with Fresco web-browser). Thus you can happily use this viewer with TopModel; build your own world into TopModel, export it in VRML file format, put it on the web and navigate into it using !TMViewer. It is public domain so you can (and *must*) distribute it freely, provided you copy *all* the files contained in the archive. This is the very first release (v.1.00), so it isn't totally bug-free! If you want further details of !TMviewer, the latest releases, give suggestions, etc, you can contact Giancarlo Castagno at: sincro@inrete.it or Chris Hornby at Spacetech Ltd.

Undelete – Quantum Software have announced an upgrade to their Undelete program. Existing users may email them at: support@quantumsoft.co.uk to be sent the upgrade program (only 28Kb) or visit their website at http://www.cybervillage.co.uk/acorn/qs/ to download the latest version of the Model module to take it to version 1.39 (Undelete is at version 1.15).

They are also planning to set up an automatic mailing list for registered users of Undelete/Keystroke/Blinds and Impressive, so that any future upgrades or announcements can be sent directly to users when they become available. Please email: support@quantumsoft.co.uk quoting your QS product serial number and full name and address if you are interested in being added to this list.

Undelete is an easy-to-use program that allows you to recover deleted files from a floppy disc or hard drive without any fuss. Any files, directories or applications you have deleted after you have installed Undelete can be quickly recovered.

You simply see the deleted file in a list and click on it to undelete it. Undelete is designed to work on RISC OS from 3.1, and supports ADFS, IDEFS, SCSIFS, ATAFS and IZipFS. Undelete also remembers your deleted files between computer sessions!

Undelete costs £18.95 +p&p for a single user licence, or £23 through Archive. A multi-user licence costs from £70 +VAT – please phone or email Quantum for a quotation.

Usborne Exploring Nature

CD-ROM is an adaptation of the 'Usborne First Complete Book of Nature' for CD-ROM, designed and produced by media specialists Main Communications of Winchester.

With realistic illustrations, and text written by teachers, this CD-ROM provides a classroom and library resource of the highest order for all primary, middle and secondary schools. Access to the resources is simple, using a menu picture of the inside of a child's study bedroom. From here the user can pass through windows or an open door into a metaphorical natural world featuring common habitats. Screen 'hot spots' allow the user to find species of flora and fauna in their correct context. A naturalist's toolbox with camera, notebook, binoculars, tape measure and other measuring devices lets the user analyse key features. Back at the study bedroom, the user can browse through a themed bookcase with hundreds of pages of exportable sprites and text. Basic information is also quickly available through a reference option.

Usborne Exploring Nature CD-ROM costs £42.51 +p&p +VAT from Hampshire Microtechnology Centre, or £49 through Archive.

Victorian Crime and Punishment is a major multimedia resource and datahandling package for Key Stages 2–3 History and IT. It revolves around a (Pinpoint) datafile of information on some 378 prisoners, including scanned images of their mugshots, from County Gaol Habitual Criminals registers of 1869 to 1878. It provides more than a complete term's work for a whole class. The package is designed to introduce datahandling in a structured way, whilst at the same time encouraging a questioning and exploratory approach to the study of history and historical sources. It was developed in collaboration with the Cambridgeshire Curriculum Agency and Cambridgeshire Constabulary. It includes a 175 page searchable multimedia binder of historical background information, and a 64 page book containing teachers' notes and photocopiable worksheets. It requires Pinpoint 2 or Junior Pinpoint. Victorian Crime and Punishment costs £41 +p&p +VAT from Longman Logotron, or £48 through Archive.

ATTENTION ALL GAME PLAYERS!

PCJOY - PC joystick interface for all Acorn Risc OS machines

PCJoy provides full PC game port compatability, enabling the use of analogue joysticks or joypads with multiple fire buttons, and the use of 2 joysticks with an inexpensive adaptor. Supplied with full Risc OS software and PC card drivers

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All prices include P&P. All trademarks acknowleged. E&OE.

WimpBasic from Clares Micro Supplies, is a total programming environment for RISC OS 3.1 and later. It enables you to write WIMP applications without having to understand how the RISC OS windows environment works. WimpBasic handles it all for you, and it enables you to write applications quickly. Wimp Basic has a graphical Menu Creator, graphical Window Creator, interactive Variables Editor and an easy-to-use Code Editor, complete with 'Throwback' that enables you to enter the code at the line causing the error. A comprehensive set of tutorial applications (some producing useful applications) is also provided.

WimpBasic costs £49.95 inc VAT from Clares, or £46 through Archive. (See the reviewer's initial comments on page 36.)

ZeriLink 2.00 enables a 400Kb/sec file transfer link between a RiscPC and an IBM PC, two RiscPCs, or two IBM PCs, via the parallel port. Except for the parallel cable, no additional hardware is needed. IBM PCs should, however, have a parallel port which supports ECP (available on nearly all multi-I/O cards) and should have an 80386 or better. ZeriLink is Shareware and is available from John Kortink's web page at: www.inter.nl.net/users/J.Kortink It costs 30 guilders. Not much for half an Ethernet.

Product News

Inclusive Technology – April 15th 1997 will mark the launch of I.T. Art and Mental Health at the House of Lords, a ground-breaking exhibition focusing on pieces of computer artwork created by adults with mental health difficulties. Organised by the National Council for Educational Technology (NCET) and sponsored by Inclusive Technology, educational suppliers of special needs computer products, this is the first public exhibition of its kind. The exhibition will coincide with the launch of the new online Special Needs Service from Inclusive Technology.

In this country, mental health problems, ranging from schizophrenia to depression, affect more than 6 million people (about 1 in 7 living in private households). The I.T. Art and Mental Health exhibition has been designed to raise public awareness of the positive relationship that can be formed between people with mental health difficulties and computers, thus encouraging and alerting staff working in colleges, hospitals and psychiatric day centres to the potential of computers in aiding the rehabilitation process.

The exhibition will include twenty totally different pieces of computer artwork from artists in day centres and colleges who are using computers to help people with mental health problems. By taking the exhibition on tour around the country, NCET and Inclusive Technology will be making a positive step forward for people with mental health problems. A list of venues and further information on the exhibition can be obtained from Sally McKeown at NCET.

Further information on Inclusive Technology's online Special Needs Service can be obtained from Roger Bates, Information Director at Inclusive Technology. The new online Special Needs Service can be found on Inclusive's website – Inclusive.co.uk.

Makaton Symbols are widely used by a whole range of teachers, care assistants, therapists and their clients or students. The Makaton Database contains over 1800 Symbols and Signs. Symbols are the core vocabulary (revised 1996) to reflect the basic everyday requirements of children and adults, as well as the needs of a multi-cultural society. Signs used with the Makaton Programme are from British Sign Language (BSL). At the moment, Makaton Signs and Symbols is only available on PC, but an Acorn version of the Makaton Database, with the Makaton Core vocabulary, is in preparation – we'll let you know when it becomes available.

Topologika working to improve handwriting worldwide – Topologika are sponsoring the Society for Italic Handwriting's 1997 Handwriting initiative – watch out for details of this later in the year. Latest information can be found in the Press Resources section of their website. Other software companies involved in this are SEMERC (Oldham) and Softease Ltd.

For further information, contact Brian Kerslake at Topologika.

Review software received...

•Accessory (u) •LispCalc (u) •Kalah (u) •The Games Suite 2 (pg).

g=Game, p=Programming, u=Utility. ◆

Wakefield Acorn Spring Show

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Organised by the Wakefield Acorn Computer (User) Group

Further information from the co-organisers

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Scrabble on the Pocket Book

Audrey Laski

I used to play Scrabble with an ageing relative, and the memory was not a happy one – something like the Thurber cartoon of a large and aggressive lady bent over a croquet mallet with the caption: "Momma always gets mad and spoils the game for everybody." I never thought to enjoy the game, but playing against an imaginary opponent living in the Psion Scrabble SSD is an entirely different matter; they don't gloat, carp or get impatient, even when I take twenty five minutes of thinking and they take three to complete a game, winning by a hundred points or so.

The named opponents are one of the great charms of this Pocket Book/Psion version of the classic word game, and I'll come back to them. But first I should say that this is an admirably user-engineered, imaginatively put together, palmtop version of a game which many people love, and more will, like me, get to love as a private pleasure. It can be played with human opponents, but sharing a tool as small as a palmtop is never a very comfortable experience.

The Scrabble screen is divided into two halves, so that the user can choose, say, an overview of the board on one side, and a small, medium or large blow-up of a part of it on the other, which makes the tile values more visible. There is also a bar showing the user's tiles, refilled after each move until the bag is empty, customisable to random or alphabetic sorting, and an information window showing the names and status of the players, the number of tiles left in the bag, the players' times (in timed games) and other less helpful information.

As I like to play it, the system provides the user with up to three machine opponents, who can be chosen from a team of fifty. Ten of these are anonymous, and simply ranked for skill; the best is alleged to be able to beat all human Scrabble champions, and I can believe it. The other forty are given names and personalities, or at least jobs and hobbies, and again ranked for general Scrabble-playing skill, and also for knowledge of the little two and three letter words which enable a cunning player to multiply points by cobbling several together. I'm working my way up; once I've beaten one of the very poor players, I move on to a slightly better one and get roundly beaten myself; the names add some human interest. Surely it's not by accident that the very worst player shares a surname with global software's version of Lord Lloyd-Webber!

The range of options for the user is remarkable. You can play a practice game, in which you see your opponents' tiles, and time taken is not registered, or (my current choice) a friendly one, in which neither of those conditions holds, but you still can take as much time as you like, make mistakes without penalty, and get advice after a move, or hints before it. Alternatively, if you have the confidence, you can play competition games, in which mistakes and overruns are penalised and your score is registered. Other options are a version of Rainbow Scrabble for children, an infinite game, and a Setup game for problem-solving. If you want to be given hints, you can choose what kind of hints you will receive, in what order, from the very subtle, such as how many points the hinted word would provide, to much broader ones, such as the first letter or the area of the board.

I have a few grumbles, of course. The manual, though generally lively and helpful, omits some necessary information, such as the way to tell the system what letter your wild tile represents (Shift and the chosen letter). It's in the on-line Help, but a manual which even lists the permissible two-letter words should carry all the necessary playing information. Some of the statements on the information window I find completely opaque, and again, the manual doesn't enlighten me. The highlighting of the word played by an opponent is held so briefly that a moment's inattention is enough to miss it, and towards the end of the game, when the board is crowded, it is quite hard to see where it has been played, especially as the cursor remains at the end of one's own last move. Also I should like to be able to set my choices as to board size semi-permanently so that I don't have to go through <shift-V> every time.

These are only minor niggles to be set against the general excellence of the planning and presentation. I have been saved for Scrabble by this brilliant pocket version; sometime I may even have the confidence to play a competition game, though it will certainly only

be against one of the patient, good-humoured players living inside my machine.

Scrabble for the Pocket Book II / Psion 3a costs £49.95 incVAT, or £47 through Archive. ◆

Network Computer Column

Richard Bradbury

You may be forgiven for wondering what happened to the long-awaited January launch of the Acorn NetStation. The good news is that you can now order one from your friendly neighbourhood Centre of Technology, but you won't be seeing any in Dixons for a while yet. Also, Acorn has, for some time, been shipping production NCs to customers in the Cable Co. and Tele Co. arena.

After missing the Christmas consumer bonanza, NChannel has now missed its own launch deadline for the second time. The company maintains its vow of silence, declining to make press comments. Meanwhile, as reported in February's Acorn User, Acorn has terminated the distribution agreement it had with NChannel. Acorn has removed its representation from NChannel International's board, but I don't know what has become of its 44.5% stake.

Rumours of an acrimonious split over a failure to obtain enough units for a viable launch have, apparently, been greatly exaggerated. Kevin Coleman, Acorn's head of corporate communications, describes it as "...an harmonious rearrangement of Acorn's and NChannel's affairs." Following the reorientation of Acorn as a technology developer, the company "...believes that it is no longer appropriate to retain an interest in a company which is a volume distributor of products."

The fear voiced by the Acorn User news item was that NChannel was considering dropping the NetStation in favour of alternative product lines. However, these fears seem unwarranted: "Following the end of the agreement, NChannel still intends to manufacture the Acorn-designed products under licence. NChannel will continue to target the UK consumer market using the Acorn reference designs. Acorn also expects to address the consumer market through partnerships and alliances with major network operators."

Given that NChannel is sticking with the Acorn machine, we must just hope that they get their act together and launch as soon as possible. The company's other option, of course, is to curl up and die. But with so much investment riding on the NetStation, and so much money to be made (if the American picture is anything to go by), it seems unlikely that NChannel is ready to admit defeat yet.

Acorn, of course, is commercially insulated from the fortunes (or otherwise) of NChannel because of the way in which the company was originally set up last June. From Acorn's perspective, NChannel is just one potential consumer electronics manufacturer among many (Funai, IDEA, Uniden, Akai, RCA, Proton, Olivetti). To reiterate previous remarks, I believe 1997 will be the test for the Network Computer concept, and only after next Christmas will we see how successful Acorn's contribution has been.

All quiet on NC Front?

After a flurry of activity surrounding the Christmas season, the NC scene has been taking a well-earned rest in February. While hardware engineers actually get round to building the machines they announced in 1996, the Java team at Sun Microsystems forges ahead with its continuing mission to conquer the hearts and minds of software developers. The selection of class libraries in the Java portfolio seems to have multiplied each time I take a look at the web site (http://www.javasoft.com/). The latest release of the Java Development Toolkit (Windows 95/NT and Solaris only, I'm afraid) includes all sorts of new goodies.

As JDK 1.0.2 gives way to version 1.1, in comes a management API, with support for SNMP (Simple Network Management Protocol). Also new is a telephony API to enable control of telecoms equipment. This is being developed in collaboration with Lucent (formerly Bell Laboratories), Nortel (formerly Northern Telecom), Novell (always Novell) and Intel.

With the new release, JavaSoft has taken the opportunity to give a much needed overhaul to the Abstract Windowing Toolkit. Java's graphical user

interface has a new event model, and now sports such revolutionary features as clipboard cut-and-paste, pop-up menus and printing. Other revisions include support for the 16-bit UNICODE character set which is especially important for countries where the Latin alphabet is not the norm. JavaSoft clearly has its sights set on Far Eastern markets.

Also making its debut in this release is a database connectivity API which allows Java code to access databases through an open, vendor-neutral, SQL-like interface. Drivers are being made available for the major database products. Finally, the new Remote Method Invocation is a resurrection of an old Sun idea, the Remote Procedure Call. Using RMI, an object residing in one Java virtual machine can call a method of an object in any other VM. It's a primitive form of distributed processing when compared with modern architectures like CORBA, but it represents a good foundation for building simple distributed applications.

Microsoft out of line

In an amusing twist to the ongoing Microsoft/Sun feud over Java (Archive 10.5 p.23 and 10.6 p.20), it has been discovered that certain applets written with JDK 1.1 simply won't run on Microsoft Explorer 3.0. Predictably, the Redmond camp claims that Sun is callously "disenfranchising the largest group of Java users on the planet," (as one Microsoft spokesman put it). The Mountain View spin, however, is that the ball is in Microsoft's court, and that it is the software giant's responsibility to fix the problem in Explorer.

The crux of the matter is the Java Native Interface (JNI), another feature new to JDK 1.1. This is designed to allow Java programs access to low-level resources on the host machine, such as 3D graphics rendering engines. The problem with Explorer is that Microsoft has already bolted on its own native interface, based on its proprietary ActiveX technology. (ActiveX is a development of the Microsoft Foundation Classes and Object Linking/Embedding mechanisms and is part of a wider distributed component strategy which will rival CORBA/OpenDoc.)

The 'official' JavaSoft JNI offers compatibility between all Java-enabled platforms. Taking the example of the 3D accelerator, the same Java code would be able to talk to the graphics card irrespective of whether it was installed in a Wintel PC, a Linux Alpha or even a Mark III RiscPC with PCI expansion slots. Using the Microsoft approach, on the other hand, limits your Java code to those platforms with ActiveX support. And that means Windows 95, Windows NT, and possibly MacOS in the future.

So it's not surprising that Sun officials are annoyed. Widespread adoption of the ActiveX approach would effectively scupper the platform-neutral attractions of Java, whilst leaving minority platforms like Unix and RISC OS out in the cold. A counter-offensive is underway with the "100% Pure Java" campaign (see last month's column). Moreover, the terms of Microsoft's JDK licence contractually oblige it to support all features of the JDK in its Java products.

Even if Microsoft accepts defeat and incorporates the JNI into Explorer, it is almost certain that the ActiveX interface will be retained alongside. Then the tables will be turned: Explorer will be able to run all Java programs, but those which use the ActiveX classes will only be compatible with those platforms Microsoft chooses to support.

Chips are down for JavaOS

ARM hasn't failed to notice the stir (sic!) caused by Java and, to ensure future support for its architecture, it has teamed up with Sun to provide direct JavaOS support on the ARM and StrongARM. Developers will be able to both license JavaOS/ARM and get vital technical support directly from JavaSoft.

The JavaOS platform is something of a competitor to Acorn's NCOS and also something of a departure from traditional operating systems which tend to be closely coupled to particular processor architectures. JavaOS is an operating system written entirely in the Java language, so it can run on any Java-enabled platform. Even the low-level device drivers are written in Java rather than C, the staple of die-hard systems programmers. This approach is clearly optimal for Sun's microJava architecture – processors whose native instruction set is Java bytecode – but as we have already seen with DEC's port of JavaOS to the StrongARM (Archive 10.3, p.32), performance on other architectures can be pretty impressive too, especially when the Java interpreter fits neatly into the on-chip instruction cache!

Speaking of the microJava, Sun has big plans for these little chips. The applications in network

computers and consumer electronics devices are plain enough (Sun's first generation JavaStation uses a microSparc, but future models will almost certainly use the new technology), but have you considered hardware Java acceleration for your desktop PC? For $99 (about £60) you will be able to buy JavaBlaster, an ISA or PCI expansion card with an on-board Java chip. Due to the lower bus bandwidth, the ISA version of the add-on will offer lower performance, but will enable pre-Pentium motherboards to benefit.

Toshiba, on the other hand, has a different rescue strategy for 'obsolete' Wintel PCs. Rather than binning your PC in favour of a shiny new NC, you can install JVOS on your hard disc as an alternative to DOS/Windows. Described by Toshiba as "a Java and Internet OS for PCs", JVOS will only run Java-based applications, but could give a new lease of life to millions of machines which would otherwise be destined for the scrap heap. JVOS is based on Toshiba's microITRON operating system and incorporates a just-in-time compiler which generates optimised i80x86 code from bytecode when the Java classes are first loaded. This is the only way to get the necessary runtime performance on lower-end Intel CPUs, and should give a useful boost even to Pentium PCs.

Green with envy?

And for all those frustrated Fresco users out there in Acorn land who are itching to run even a simple 'Hello World' Java applet, hope may be at hand. Fed up with waiting for the official Acorn solution, a New Zealander has decided to write a RISC OS Java interpreter himself. Peter Naulls – better known as Chocky in the murky world of Internet Relay Chat – has christened his project Chockcino, which fits in nicely with the other coffee-related names currently in vogue.

Peter is writing the system from scratch – in other words, it is not based on the JDK, and so isn't subject to Sun's licensing agreement. The basic class libraries, however, can only be obtained from Sun. Chockcino will implement the Java threads package with the help of Neil Carson's threading module, which is good news for the majority of us who don't have access to a Hydra multiprocessor machine.

As well as the basic bytecode interpreter, class loader and garbage collector, Peter has plans for an applet viewer and a just-in-time compiler to speed things up a bit. Looking further into the future, he hopes to develop a source code compiler (Java source to bytecode) and a proper Java-enabled web browser. The first stage in the master plan (http://lucy.cs.waikato.ac.nz/~pnaulls/java/) is to release the basic interpreter to early adopters as 'donationware', requesting a £15 fee. These beta testers will be the first to get their hands on the latest releases, and will enjoy technical support from the author.

The other possibility is that Chockcino will disappear down the plug-hole of commercial development. This would make it a competitor for the as-yet unreleased Fresco Java code written by ANT. Negotiations with developers are currently underway. Whichever way up the coin lands, I wish Peter every success in this enterprise, and hope that Chockcino serves to concentrate the minds of others.

Acorn in the news

The big Acorn story last month was the deal clinched with Curtis Mathes, a texas-based design and engineering firm. Under the agreement, the company will be able to build the Acorn NC designs into television sets and set-top boxes. Buying in technology enables Curtis Mathes to enter the interactive television market much sooner than it would otherwise have been able to do. The list of features it hopes to incorporate into its UniView line is lengthy: Internet access, television listings, VCR programming, parental controls and electronic mail are mentioned, along with telephony features, fax and caller identity.

Along with the Acorn's financial statement comes a new corporate strategy to build the Acorn name as an international brand. Gone are the separate logos for Online Media, ANC and ART. These are now simply referred to as divisions, with the emphasis shifted to Acorn as a unified technology company.

With its shiny new image, Acorn has been showing off some of its technology to the wider world. It may be nothing new to you and me, but being able to display steady computer images on low-resolution interlaced television displays is exciting technology to some, and it even has a technical name – *anti-twittering*. Following the popular trend, Acorn has now also given a name to the solution it developed for the A3010, the STB and the NC – *TVCentric*.

Not content with one new trademark, Acorn has announced another clever idea, which is going to make its debut in the Curtis Mathes UniView products. Its 'flashDisplay' incorporates a chunk of flash memory into the set-top box, and tries to predict which web link you are going to click on next. It speculatively downloads web pages during idle periods so that when you select a link, the HTML page is already there waiting for you. Adding a bit of intelligence to the cacheing software enables it to learn a user's most frequently accessed sites. The press release suggests that: "a week's worth of TV programme guides or appointments from a personal organiser could be instantly available when the user requests it." They say the best ideas are the simple ones, and this one seems a sure-fire winner to me.

Richard Bradbury <R.J.Bradbury@iee.org>

Small Ads

(Small ads for **Acorn 32-bit computers** (i.e. not BBCs) *and related products are free for subscribers but we reserve the right to publish all, part or none of the material you send, as we think fit. i.e. some people don't know what 'small' means and there are certain things, as you can imagine, that we would not be prepared to advertise as a matter of principle. Sending small ads (especially long ones!) on disc is helpful but not essential. Ed.)*

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A3010, 4Mb 80Mb IDE HD, HCCS Midi, NEC/ Multisync 2A, ideal for Sibelius, £450 o.n.o. Midi interface for A30X0 £25, 100Mb bare SCSI drive £65 o.n.o. 01223-363545 or aak66@dial.pipex.com.

A310, ARM3, RISC OS 3.1, 4Mb RAM, 47Mb SCSI HD, Midi podule, PC emulator, RISC OS 2 PRMs, C rel. 3 plus more. Offers around £300. Robin Terry on 0191-268-9429 or robin@aquitaine.demon.co.uk.

A310, 4Mb RAM, Philips RGB Monitor, RISC OS 3.1, ARM 3, IFEL backplane, IDE interface 240 Mb HD, 8-bit sampler card £395, and Conner 425 Mb IDE HD in perf. cond. £70. Phone Tom (in Norway) +44 739-14-927 or TomADuke@stud.iaf.hist.no.

A440/1 4Mb RAM, 50Mb HD, ARM3, VIDC enhancer, RISC OS 3.11, AKF18 monitor £325. Phone 01344-761493.

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ARM 710 card £50, Eureka £50, Sbase Developer £50, Canon BJ10 EX Printer with CC TurboDriver £95 o.n.o. Mike on 0181-994-7683.

Magpie 1A.50 £23, Pendown Plus 1.30 £13, Arcade Games Creator £13, PC Emulator 1.8 + DOS £13, Quickshow video titler £7, Render Bender £13, Slideshow £7, PC-DOS 6.3 £13, QuickKey £6. K Tompkins <kjt@argonet.co.uk> or 01276-28932.

Mitsubishi G370-10 colour thermal printer ~2 years old, as new, with one colour film, full working order, would like ~£1,000, make me an offer, must sell. Alex on 01949-860738, eves.

Panasonic KX-P37 sheetfeeder (for use with KX-P1180, 1123 etc) £20 + carriage. Phone or fax 01933-223036.

PC Emulator Shareware Collection 1 & 2 £10, Investigating Local Industry £20, Risc User Fonts Discs 1 & 2 £10, Topologika Art Machine 1 & 2 £20, Chopper Force £5, Xenon 2 £5. Phone 01737-832159 (eves).

RiscPC 600, 16+1Mb, two slices, 400Mb and 170Mb IDE drives, Acorn AKF60 monitor, 16-bit Minnie sound card, Publisher and Artworks £900. CC LaserDirect card and Canon LBP4 laser printer £275, Acorn 486 PC Card, DOS 6.0, PCPro and PC Exchange software £140, Morley SCSI card £50, Acorn MIDI card, Rhapsody 3 + Serenade £120. All ex. cond. G. Rhodes on 01302-338312 eves.

Software: PipeDream 4, FlexiFile, Squirrel 1.2, Sleuth 1.5, Publish Art 2, Minotaur, Zarch, Holed

Out!! + Extra Courses vols.1 & 2, Lemmings, Oh No! More Lemmings. Offers for all or part. Phone or fax 01933-223036.

Wanted – Ergo or A4000 keyboard in good condition + Cyber Chess. Paul on 01604-643978. ◆

Hints and Tips

Abbreviations in PipeDream – I run a sales system in PipeDream. One of the features is that we can type a short name into the first column of the sales sheet. If it finds the short name in the first column of the address list, it replaces it by the expanded full name. So, if I typed in 'NCS', PipeDream would recognise this and replace it with Norwich Computer Services. The formula is:

```
if(type(lookup(B195,[Addresses]C$1C$1-
000,[Addresses]C$1C$1000))="error",se-
t_value(B195,lookup(B195,[Addresses]A-
$1A$1000,[Addresses]C$1C$1000)),"OK")
```

Once the full name has been inserted, the formula returns OK. If the short name doesn't exist, then an 'error' is given. This is very useful – it also shows that the customer exists in the database and has been accepted.

Richard Torrens <4qd@argonet.co.uk>

Command line made easy – In Archive 10.6, "Multitasking Made Easy", David Wild referred to the difficulty of invoking applications from the CLI.

There are two ways to make life easy for CLI users:

- put frequently used commands in the Library (this is usually $.!Boot.Library for a RiscPC)
- use aliases (set Alias$...)

The latter is used by WIMP apps to record how to do certain actions. It can also be used in RISC OS without any additional software to make shortcuts for CLI users.

As I use several systems at work, I often type the 'wrong' command when I change systems. Under RISC OS this is no problem, I simply Alias$ the foreign string to the local one. For example:

```
set Alias$ls : cat
```

so if I have been overdoing the UNIX during the day, it still works. Simple!

Peter Chambers <peter@hightown.demon.co.uk>

Creating a font table – I have created a file using TableMate Designer (v4.01a) showing a table of the keyboard ASCII numbers and the characters they produce for a given font. The file is included on this month's disc.

The default is Trinity.Medium, but by the use of the TableMate style options, you can change the font to any other font, and the character set will be changed and displayed in the appropriate column.

Font Table for Trinity.Medium

ALT +	Char.	ALT +	Char.	ALT +	Char.	ALT +	Char.	ALT +	Char.	ALT +	Char.
33	!	71	G	109	m	147	›	185	¹	223	ß
34	"	72	H	110	n	148	"	186	º	224	à
35	#	73	I	111	o	149	"	187	»	225	á
36	$	74	J	112	p	150	–	188	¼	226	â

To alter the style, first you have to enter the Edit Style option. You can do this either through the standard RISC OS menu options, or by <ctrl-f6>. From this window, you click on the Name pop-up button, and from the options that appear, select FontDemo. Then you repeat the process for the Font Name. The list of fonts that appears from this menu will depend on the fonts currently installed into your font manager. The only part that you have to change manually is the Font Name in the Header line.

67	C	105	i	143	•	181	µ	219	Û		
68	D	106	j	144	'	182	¶	220	Ü		
69	E	107	k	145	'	183	·	221	Ý		
70	F	108	l	146	‚	184	¸	222	Þ	©JFF 3/97	
Example		The quick brown fox jumps over the lazy dog.									

At any time, the table can be printed, saved or exported to Draw, CSV or even HTML File formats. If you save the table out as a drawfile, you can then load it into CC's ArtWorks where you can create some unusual graduated cell backgrounds within the table. However, before you do this, make sure you are 100% happy with the rest of the table, and save it as a TableMate file because Draw/Artworks files cannot be reloaded into Tablemate.

(If you don't have Tablemate, you can load the drawfile version – also on the monthly disc – and Select All, Style–Font name and select the font you want. That's OK unless you want to display something like Dingbats

– the ASCII numbers all turn into Dingbats, so you can't see what's what! Ed.)

Jonathan Frankl, Bradford

Creating neat screenshots – If you are using the screen-grab facility in Paint, to capture part of the screen – one or more windows – then you get a much neater result if you open a blank (white) Edit window or Impression window, and then arrange the windows to be grabbed in front of that. It means that you get a nice clean white border around the windows – much neater for an illustration in Archive!

Ed. <paul.NCS@paston.co.uk>

Deleting text from writable icons (10.6 p.23) I have been using the IClear module until recently but found that it interfered with some applications such as Impact and a simple banking program (Illegal window handle type errors). So now I've used Keystroke to give a <ctrl-U> when I hold <alt> and click <select> in the icon. I find this even easier than IClear.

(Keystroke is GREAT, but it's a pig to know how to set things up. I tried to set up <alt>-<select> but failed, so I asked Alan to explain. Ed.)

I achieved it with just one operation. I opened a Keystroke window as usual and ensured it had the focus. I held down <alt>, and clicked in the top RH box with <select>. 'Alt' blacked out at the top of the Keystroke window, and 'Select' showed in the top RH box. I then chose 'Insert text' and simply put |U in the writable icon labelled 'text:' and pressed <return>... ...and that's it – just a one-page Keystroke macro! Now I simply place the pointer in a writable icon, hold down an <alt> key and click <select>. Any text in the icon is immediately cleared.

Alan Gentle <alang@parkside.zynet.co.uk>

File download with ANT Suite – In the January Hints and Tips (10.4 p29), Paul suggested creating a dummy email in ANT's Marcel in order to fetch deeply-buried files from an FTP site.

An alternative method is to add the FTP URL to the Hotlist. If the FTP client is not loaded, the Hotlist will call upon Fresco in preference.

In addition, any FTP URLs in the Hotlist are also available from the list in the FTP client "Connect..." window. Any extra path information supplied in the URL appears in the "Directory" field.

Nick Chalk <nickchalk@enterprise.net>

Fractions – I read Gerald Chandler's column on fractions (10.6 page 75) with great interest, but from a different perspective. I *enjoy* fractions – they remind me of a time of quality in engineering, of leather aprons and craft workshops. Brilliant! So when I read of the problem, I thought that there had to be a better way (or rather another way). I thought that most people would not want to be limited to a few specialised fonts, so this is my suggestion.

I think that the way forward is to use one of Gerald's early suggestions, namely that of adjusting the super- and sub-script options and to adjust the kerning to give you the characters you require.

The problem, as was quite rightly pointed out, was the vast number of keystrokes required to get to the finished result. A lot of keystrokes?... ...call for Keystroke!

I suppose most of you know of Keystroke from Quantum Software. This brilliant utility allows you to automate your keyboard so that with a touch of a key, dozens of things can happen, menus open, text gets typed in, windows moved, almost anything and setting it up is so easy. In fact, I have to say that there has not been a repetitive job I ever come across that !Keystroke couldn't handle – it has saved me hours and hours of work. Enough of the advert, if you don't have Keystroke then get it – you won't be sorry. Still, if you remain unconvinced you can have a bit of it for free! Read on...

The requirement is to type in a long series of commands to your wordprocessor to get your text displayed correctly. In Impression, the commands needed to type in one eighth would be something like:

{script super}{kern 0 –50}1{script}{kern 0 50}/{script sub}{kern 0 200}8{script}

A space after the final {script} is important. It produces: 1/8

Fortunately, Stuart at Quantum (home of !Keystroke) has written a little basic program that will effectively

'type in' any text you like. The program (called Sendtext) is distributed with !Keystroke (in the !KeyLib) and (with any luck) will be distributed on this month's magazine disc.

You could use the program from an obeyfile using something like :

<Obey$Dir>.Sendtext {script super}{kern 0 −50}1{script}{kern 0 50}/{script sub}{kern 0 200}8{script}

You could then have obey files for each fraction. Every time you wanted a fraction then all you'd need to do would be to double-click the obey file.

Even neater would be to use Dave Thomas's excellent !Makro. The copy I've sent to Paul is all set up and ready to go. If you use it, drop a line to Dave and tell him how good it is, he's a good chap and we all do better with a bit of encouragement.

So there you go – easy fractions in any font at the click of a button. By the way, when I asked Stuart if I could use his software like this, he had no hesitation in agreeing. Thanks, Stuart, on behalf of all Archive readers!

Bob Harding, 40 Bremhill, Calne, Wilts. SN11 9LD. <rharding@argonet.co.uk>

Impression background printing

– To print from Impression in the background, save the document, quit it from memory, then drag it onto the printer icon on the iconbar.

Frank Jukes <frank@fjukes.demon.co.uk>

Impression centring graphics

– Now I know this may seem obvious to some of you, but you'd be amazed at the number of articles I get with graphics centred by eye, with spaces. The first essential is to know about embedding a graphic in the text. This can be done by dropping it in, or by copying it with <ctrl-C> and pasting it with <ctrl-shift-F>. So, to centre a graphic, press <return> at the end of the paragraph below which the graphic is to go so that the cursor is on a blank line between the two paragraphs. Now press <f6>, and the cursor will move to the centre of the page or column. Now drop the graphic in there, or paste with <ctrl-shift-F>.

Ed. <paul.NCS@paston.co.uk>

Midi voice tables

– In my beginners' article "Midi For The Masses" (10.3 p28), I referred to tables detailing the 128 voices of the General Midi set. These should relate easily to the software patches, as used with ReMIDI, where the patch filename is abbreviated and its meaning probably not obvious to the beginner. The tables were not actually printed with the article – no doubt due to limited space – although the TableMate-3 and Drawfile versions were included on the subscription disc. Non-disc subscribers, however, would have been at a disadvantage. Also included is a table of the General MIDI Percussion Drum Set along with their pitch identification.

I hope readers will find these of interest.

Colin Sutton, Bradford

General MIDI Percussion Drum Set (Channel 10)

NOTE: The numbers given below are not patch numbers - they are the actual note numbers eg. 60 represents C4 i.e. Middle C.

27	D#1	High Q	48	C3	High tom 2	69	A4	Cabasa
28	E1	Slap	49	C#3	Crash cymbal 1	70	A#4	Maracas
29	F1	Scratch push	50	D3	High tom 1	71	B4	Short hi whistle
30	F#1	Scratch pull	51	D#3	Ride cymbal 1	72	C5	Long low whistle
31	G1	Sticks	52	E3	Chinese cymbal	73	C#5	Short guiro
32	G#1	Square click	53	F3	Ride bell	74	D5	Long guiro
33	A1	Metronome click	54	F#3	Tambourine	75	D#5	Claves
34	A#1	Metronome bell	55	G3	Splash cymbal	76	E5	High wood block
35	B1	Kick bass drum 2	56	G#3	Cowbell	77	F5	Low wood block
36	C2	Kick bass drum 1	57	A3	Crash cymbal 2	78	F#5	Muted cuica
37	C#2	Side stick	58	A#3	Vibra slap	79	G5	Open cuica
38	D2	Snare drum 1	59	B3	Ride cymbal 2	80	G#5	Mute triangle
39	D#2	Hand clap	60	C4	High bongo	81	A5	Open triangle
40	E2	Elec. Snare drum 2	61	C#4	Low bongo	82	A#5	Shaker
41	F2	Low floor tom 2	62	D4	Mute high conga	83	B5	Jingle Bell
42	F#2	Closed hihat	63	D#4	Open high conga	84	C6	Belltree
43	G2	High floor tom 1	64	E4	Low conga	85	C#6	Castanets
44	G#2	Pedal hihat	65	F4	High timbale	86	D6	Mute surdo
45	A2	Mid tom 2	66	F#4	Low timbale	87	D#6	Open surdo
46	A#2	Open hihat	67	G4	High agogo	Compiled by Colin L. Sutton.		
47	B2	Mid tom 1	68	G#4	Low agogo	DTP © CLS 10/96.		

Multitasking made easy – Like David Wild (10.6 p57), I often want to run a program in background in its own task window which I can subsequently scroll. Here is another, quick way of doing it.

1. Use your text editor (Edit etc) to create an obey file, and enter the one-liner:

```
*TaskWindow -display -quit
```

2. While holding down <shift>, drag the file you want to run so that the complete path name follows after the `-quit` parameter.

3. Save this obey file with a name such as "DOIT".

4. Double-click "DOIT", and your program will run in the background in its own task window.

The parameters are optional:

`-display` opens the task window, which will open anyway if the program puts anything out to the screen

`-quit` finishes the task without the option of running another task in that same window.

Sherwin Hall <100101.3577@CompuServe.COM>

Printers on the iconbar – I stopped using TurboDrivers when I fitted the StrongARM, primarily because Computer Concepts were so slow in sending out upgrades, and have only just installed it. Eventually, one tires of waiting for !Publisher to complete printing under the Acorn printer driver – even with version 1.54 and 'background' printing enabled.

When I had finished using the !Install program, I double-clicked on !Printers in Resources:$.Apps. I then dragged two copies of the DeskJet printer driver to the Printer control panel (IconBar Menu/ Printer control...) and configured them, one for high resolution (300×300) and the other for draft (150×150) printing. At this stage, I found that I had six printer icons on the iconbar. From left to right, there were the original pair of DeskJet icons (same

General MIDI Sounds (128 Patches / Voices)

Piano	Bass	Reed	Synth. SFX
1 Grand Ac. Piano	33 Acoustic Bass	65 Soprano Sax	97 Ice Rain
2 Brite Acoustic Piano	34 Elec. Bass Fingered	66 Alto Sax	98 Soundtrack
3 Elec. Grand Piano	35 Elect. Bass Picked	67 Tenor Sax	99 Crystal
4 Honky-Tonk Piano	36 Fretless Bass	68 Baritone Sax	100 Atmosphere
5 Electric Piano 1	37 Slap Bass 1	69 Oboe	101 Brightness
6 Electric Piano 2	38 Slap Bass 2	70 English Horn	102 Goblins
7 Harpsichord	39 Synth. Bass 1	71 Bassoon	103 Echoes
8 Clavinet	40 Synth. Bass 2	72 Clarinet	104 Sci-fi (Star Theme)
Chromatic (pitched) Percussion	**Strings / Orchestra**	**Pipe**	**Ethnic**
9 Celesta	41 Violin	73 Piccolo	105 Sitar
10 Glockenspiel	42 Viola	74 Flute	106 Banjo
11 Music Box	43 Cello	75 Recorder	107 Shamisen
12 Vibraphone	44 Contrabass	76 Pan Flute	108 Koto
13 Marimba	45 Tremolo Strings	77 Blown Bottle	109 Kalimba
14 Xylophone	46 Pizzicato Strings	78 Shakuhachi	110 Bagpipe
15 Tubular Bells	47 Orchestral Harp	79 Whistle	111 Fiddle
16 Dulcimer (Santur)	48 Timpani	80 Ocarina	112 Shanai
Organ	**Ensemble**	**Synth. Lead**	**Percussive**
17 Drawbar Organ	49 String Ensemble 1	81 Synth. Square Wave	113 Tinkle Bell
18 Percussive Organ	50 String Ensemble 2	82 Synth. Saw Wave	114 Agogo
19 Rock Organ	51 Synth. Strings 1	83 Synth. Calliope	115 Steel Drums
20 Church Organ	52 Synth. Strings 2	84 Synth. Chiff	116 Woodblock
21 Reed Organ	53 Choir Aahs	85 Synth. Charang	117 Taiko Drum
22 Accordion	54 Voice Oohs	86 Synth. Voice (Vox)	118 Melodic Tom
23 Harmonica	55 Synth. Choir (Vox)	87 Syn. 5th Saw Wave	119 Synth. Drum
24 Concertina	56 Orchestra Hit	88 Synth. Bass & Lead	120 Reverse Cymbal
Guitar	**Brass**	**Synth. Pad**	**SFX (Sound Effects)**
25 Nylon Acoustic Gtr.	57 Trumpet	89 New age (Fantasia)	121 Guitar Fret Noise
26 Steel Acoustic Gtr.	58 Trombone	90 Warm Synth. Pad	122 Breath Noise
27 Jazz Electric Guitar	59 Tuba	91 Polysynth Pad	123 Seashore
28 Clean Electric Gtr.	60 Muted Trumpet	92 Choir (Space Voice)	124 Bird Tweet
29 Muted Electric Gtr.	61 French Horn	93 Bowed Glass Pad	125 Telephone Ring
30 Overdriven Guitar	62 Brass Section	94 Metal Synth. Pad	126 Helicopter
31 Distortion Guitar	63 Synth. Brass 1	95 Halo Synth. Pad	127 Applause
32 Guitar Harmonics	64 Synth. Brass 2	96 Synth. Sweep Pad	128 Pistol (Gun Shot)

Compiled by Colin L. Sutton. DTP is © CLS 10/96.

functions as the new Turbo Icons), one for the dot-matrix printer, one for printing to send by ArcFax, and the two new Turbo icons. It was easy to switch off the two old DeskJet icons (iconbar Menu/Printer control... /Menu/Inactive), but this left four icons in an unfamiliar order.

(At this point you may be wondering why I was not simply upgrading the old, already installed version of TurboDriver I had used with the ARM 610.) Well, it may have been that it was version 4.04. At a more practical level, the earlier installation was lost in a hard disc crash.

To achieve the desired arrangement, the obvious course appeared to be to "Remove" those icons at the left which I wanted to be at the right, then re-install them by dragging the printer definition files back into the Printer control panel, and go through the process of configuration again. Was that tedious process necessary? I chose to do it another way.

The file 'Settings' (<HardDisc>.$.!Boot.Choices .Printers.Settings) contains the information relating to the printer icons on the iconbar. A little study shows the structure of this file. If you load it into Zap (or Edit, if you must), you will see a long series of identifiers down the left hand edge of the window; each consists of two lower case letters followed by a colon followed by a space. In many cases, these identifiers are followed by a string of characters, some of which are intelligible words.

The start of the file is identified by 'fv: '. Each section relating to an individual printer icon is not indicated by any clearly evident delimiters. It is necessary to find 'cl: ' and 'ic: ' which are the start and finish lines for each printer.

Make a copy of the file 'Settings' (as 'SettingsO', or some such) before starting to reorganise the listing in 'Settings'. Select all of the lines of the section ('cl: ' to 'ic: ') representing the printer icon that you want at the left hand end of the group on the iconbar and move these to immediately below 'fv: ' by pressing <ctrl-V>. In the same way, you can rearrange the section of lines relating to each of the other settings. Beware of leaving totally blank lines in the file, and ensure that one line-feed follows the last line starting 'ic: '. Save the reorganised 'Settings', quit !Printers and re-run it. Hey, presto!

It is easier to do it once you see the file and its identifiers, than it is to describe it . With the exception of the time it took me to understand the structure of the file, it took less time to rearrange the icons this way than using the 'Remove/Drag in/ Configure' method described earlier.

Of course, someone will now tell me of an easier, quicker way!?

Frank Watkinson <frank@watsnees.demon.co.uk>

Zap and Basic – Here are some hints to remedy some of the obscure bugs in the latest version of !Zap editor (version 1.35).

Failing Basic programs – One of the obscure bugs that !Zap has is that any trailing spaces on a Basic line are not removed. This can cause your program to behave very strangely, and output unexpected results. Under many circumstances, the Basic interpreter will ignore trailing spaces on a Basic line, except in the following case:

1. After the keyword OF in a "CASE .... OF" structure. The OF keyword must be the last keyword on the line. The interpreter will give the error: "CASE..OF statement must be the last thing on a line".

2. After the keyword THEN in a multi-line "IF..THEN..ELSE..ENDIF". The Basic interpreter will *not* be able to detect the trailing space and will convert the multi-line IF...ENDIF into a single line IF THEN. The Basic interpreter will not trap this error. Your program will behave differently from what you had expected. It could take you ages to discover what is happening because you can't *see* the space after the THEN keyword!!!

One solution I found is to save the file, open it in Edit, then save it back again. Edit and other Basic editors will remove trailing spaces on a Basic line.

Basic mode, Copy and Move bugs – This bug is easily encountered. You can lose your program if you don't read on.... !Zap allows you to position the cursor (using the mouse) on a line that is below the last line of the Basic program. This is normally an empty line without a line number. If you press <enter> or just type in something, !Zap will automatically put in a new incremented line number on the left hand, and your typed text appears on the

line. So far, all is fine. However, if while the cursor is on the blank line, you highlight something from somewhere else in the program and copy it or move it to the blank line, !Zap goes crazy. It will first show a wrong line number, and only part of the copied text will appear on the line. This new line is now a garbage line. You cannot move the cursor beyond it. You will not be able to delete this line. Most importantly, if you want to save your file, Zap will report an error "Not a Basic file or corrupt at offset &xxxxxxx", and you will not be able to save your file.

For example:

```
10 DIM memory% memory_size%
20 memory_pointer% memory%*4
30 byte% !memory%
```

The above is only a 3 line program, but you can place the cursor using the mouse on the fourth line (i.e. the blank line). Now highlight line 20 until the number 4 (do not highlight the complete line only the text) and copy it using <ctrl-C> to the blank line. Surprise!! The line number will be shown as 110053. The first two chars of the variable memory_pointer% disappear. You are stuck.

```
10 DIM memory% memory_size%
20 memory_pointer% memory%*4
30 byte% !memory%
110053 ory_pointer% memory%*4
```

What happens, is that there is a bug with the copy and move commands. When !Zap copies or moves a line in Basic mode, it assumes that you are copying or moving to an already existing line. In the above example, what we are doing is trying to append something to the end of the program, using the copy command, which unfortunately does not work.

The strange line number and the missing three characters from the variable are due to the fact that !Zap places the first three characters of the variable name as a three-byte tokenised line number. Worse still, this new line does not have an &0D terminating byte! That's why you cannot move beyond it.

To remedy the situation and regain control of your valuable program:

1. Place the cursor after the last character on the last line (the problematic line). In our example, after the digit 4.

2. Switch into Byte mode using <ctrl+shift+f2>.

3. Type "0" followed by "D". (i.e. insert a terminating byte).

4. Switch back to Basic mode using <ctrl+shift+f6>.

Now you find yourself after the problematic line. Now just press <Enter>, and Zap will automatically re-number the program for you and you are back in control. Don't forget to type the missing characters on the line.

Basic tokenising bug – When copying or moving in Basic mode, Zap does not automatically tokenise the new copied text.

Example:

```
10 mem% 2 :REM PRINT mem%
20
30 pointer% 1<<10
```

If you copy or move the "PRINT mem%" after the REM in line 10 to line 20, the "PRINT" keyword will not be tokenised. This will cause the program to produce errors when executed. To remedy this, after copying, place the cursor on the line (line 20 in our example) and insert a space, or whatever.

Applications not accepting Zap Basic files directly – You can save (drop) a Basic file directly into another Basic editor like DeskEdit, StrongED or Edit, but they will not accept Basic programs directly from !Zap. You have to save them first to disc then load them into the other application or Editor.

The reason for this is that most applications identify a Basic program by checking for the byte &0D to be the first byte of the Basic program. If it does not exist, they will report a "Bad Basic program".

While in Zap Basic mode, your program is stored using a special Zap format, not the standard Basic tokenised file. The format Zap uses is as follows:

1. 3-byte line number (similar to the 3-byte-encoding used by GOTO).

2. The Basic line content in a Basic tokenised form.

3. One byte terminator (&D).

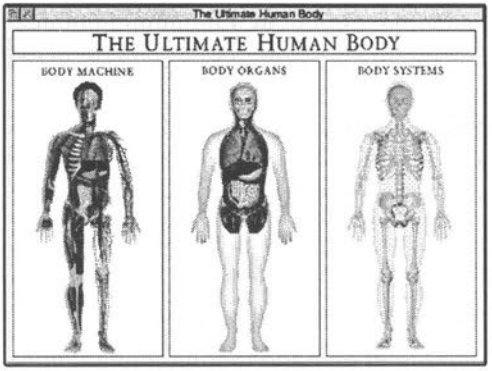
You are warned – if you drop your Basic file directly into Edit (version 1.44), Edit will crash with a Data Abort error!! So, save your program to disc first, before loading it into other applications.

Mohsen Alshayef <mohsen@qatar.net.qa>

The Ultimate Human Body

Hutch Curry

The Ultimate Human Body (TUHB) is the latest product from Innovative Media Solutions (IMS) – a company which specializes in developing software to allow some of the best IBM PC CD-ROM titles to operate on the Acorn platform. TUHB has been produced in conjunction with Dorling Kindersley (DK), the company which developed the CD for the IBM PC. For each of their products, IMS has written a reader program that is very specific for that CD. The reader takes all the data from the CD – the graphics, text, speech, music, animations and videos – and translates it into a RISC OS application. All



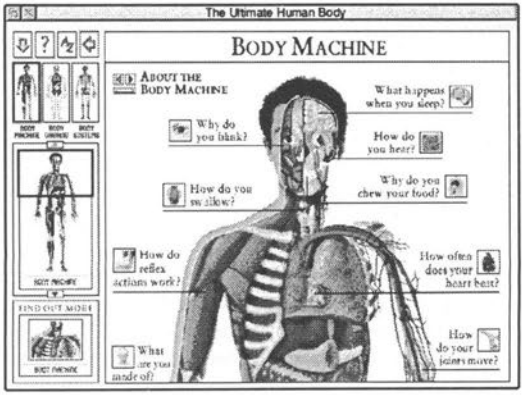
this happens transparently, behind the scenes, as you use the program. All you need to do is double-click on the reader (just like any other RISC OS program) and you now have a native version of the CD-ROM software to explore.

TUHB is designed as an interactive, informative and entertaining guide to the human body and the way in which it works. The user is invited to take a guided and illustrated tour of the structure, systems and organs of the body and learn about every single part. There are 42 separate topic articles included on the CD. To make what are complex subject areas easier to understand, every difficult word or phrase is pronounced and defined. The CD is superbly illustrated throughout, and as an indication of the vastness of the CD, there are approximately 700 screens and popups containing more than 1,000 illustrations.

The Acorn version of TUHB requires at least RISC OS 3.1, an ARM 3 processor, 4Mb of RAM, a multisync monitor (capable of at least 640×480 – Mode 28) and a double speed CD drive. The machine used for the review was one of the original RiscPC 600s now sporting a StrongARM processor, 42Mb RAM and 16-bit sound. The supplied package for the Acorn consists of the standard IBM PC CD in a very attractive box also containing a small instruction manual, and the Acorn reader software on one 3½" disc. The reader can be transferred to hard disc for more rapid access after the initial registration process has been completed.

When the TUHB reader is run, it transiently displays an attractive DK splash screen identifying the current version number (now 1.1). When the splash screen vanishes, the reader installs itself on the iconbar. Pressing <menu> over the iconbar icon brings up a menu with an item marked 'Choices...'. From here you can set a few aspects of TUHB operation. These are: 1) whether TUHB should improve the colour rendition of the illustrations in a 256 colour mode by either altering the palette or dithering the sprite, 2) whether TUHB should use dithered sprites when the user saves any pages, 3) whether sound effects should be on or off and 4) whether the audio in general should be on or off.

Clicking <select> on the icon on the iconbar opens a beautifully detailed front screen which cycles through drawings of the human body illustrating all the body systems covered on the CD. During the animation,



you can hear the sound of a heart beating in the background. When the initial display is completed, the main menu page appears (see overleaf) showing the three ways in which the body may be viewed – 'The Body Machine', 'Body Organs' and 'Body Systems'.

Whichever choice is made, you will be presented with a veritable cornucopia of visual and aural information to be explored, assimilated and enjoyed. On each page, the left part of the screen is a navigational panel which provides the means to move from one part of the CD to another quite quickly. The right part of the screen presents substantive information. Each of the text and picture icons is a link to another page or pop-up providing more detailed information about the subject. The picture at the bottom right, overleaf, is the main screen from 'The Body Machine' showing the top part of the torso. Because the body pictures are much larger than the screen, there is a scroll bar on the left navigational panel to allow you to choose which part of the body to examine.

The information presented is, as far as I can tell, factually correct and presented in such a fascinating format that I found myself spending hours wandering through the links. I think that this program will appeal to a very broad age and knowledge range of users. My only criticism is that the sheer size and wealth of material on the CD makes it sometimes difficult to go back to something previously seen. I would have found a system of bookmarks quite useful. All in all, this is an excellent offering from IMS and I would strongly urge you to buy one so that IMS will be able to bring more of the best of the PC world to the Acorn platform.

The Ultimate Human Body CD-ROM costs £38 +p&p +VAT from IMS, or £45 through Archive. ◆

Hutch Curry <hutchc@strngarm.demon.co.uk>

Pocket Book Column

Audrey Laski

More goodies from Rugby

Once again, John Woodthorpe of Rugby has sent me useful and amusing software to bring to palmtop users' attention. The most valuable, at least to users of the Psion 3a rather than the Pocket Book II, is a set of files to merge into the Agenda file, supplying such valuable material as dates of upcoming public holidays in Britain and USA, Jewish religious holidays, and astronomical information. It also has all kinds of 1997 dates for Britain, and these are so comprehensive that it may be the only one you need – it even has the party conferences! The files merge easily into Agenda and substantially increase its usefulness.

He has also sent Topix, a useful ideas outliner or, as he calls it, 'electronic thinking aloud', which has 'the advantage that virtually any file in any application can be linked into it'. Then there is Contact Edge, a contact manager which has moved from being payware into the public domain. He reckons this is 'a very powerful tool, aimed at people who regularly contact large numbers of folk, and need to keep plenty of information at their fingertips' – another tool I should have loved in the days when I carried a heavy load of administration. Finally, there's a shareware Chess from Johan Van Barel, in Belgium – but I'm still in love with Scrabble.

Notes on Notepad Deluxe

John also noted that I said I had a copy of Notepad Deluxe for review, and he urges me not to come to any quick conclusions about it. He says 'this is a superb application, but it is so powerful and flexible that it takes ages to get to grips with.' I think he is right, and will take my time. Meanwhile, he has been inventing, and collecting from the WWW and elsewhere, a quantity of Plug-ins which extend its functionality. He reckons 'the imagination is really the only limit in using it!'

Sightings

I won't go into how I came to be flipping through so unlikely a journal as Yachting World – I've neither the resources nor the courage needed for messing about in ocean-going boats – but I spotted two separate advertisements for software for sailors with Pocket Books or Psions. Prosser Scientific Instruments (01473-823005) have two tidal data programs, Tideclock 3 at £99 and Tidestream 3, with

stream and passage planning, at £116, while Maritek (0141-554-2492 email:maritek@compuserve.com) advertise, without price, a comprehensive coastal navigation program. I love the idea of the palmtop as a sailor's tool, though the thought of how easily a wave could snatch it off the palm and into the depths is alarming.

A fairly ridiculous sighting: in Matthew Norman's "Hypochondriac's Diary" on the Health page of the Guardian, 'We're a two-Psion family' – the Hypochondriac explaining how his wife comes to switch on his palmtop by mistake and finds it opens on a compromising phone number. It suggests a health warning; if you're a two Psion or two Pocket Book family, make sure you move away from secret stuff before switching off, or use a password, or have one of those new personalised shells so that your partner at least doesn't have the excuse.

Endnote

Ending where I began, I should just like to point out that John Woodthorpe seems to have been my only correspondent this month, and though he is a host in himself, it seems unfair to expect him to carry so much of the column single-handed. ◆

Creating Web Pages – Part 1

Richard Simpson

This series of articles will help you to produce your own pages for the World Wide Web. Although obviously written with Acorn in mind, it should be universally applicable.

Creating useful web pages is not difficult. Only a few weeks ago, I was a complete novice, but then I discovered that Surrey County Council provides free web space to local non-profit organisations. The chance of free publicity for the Farnham Shakespeare Company was not to be missed, so I bought a book on creating web pages and got started. The results of my efforts can be found at `http://www.surreyweb.org.uk/fsc`, and I shall be using these pages as examples during the series.

Each Web page is defined using a single file written in HyperText Markup Language (HTML). In addition, a website will contain a file for each graphic used and possibly exotica such as Java applets and sound clips. As with discs, it usually makes sense to organise the files into a directory structure.

Your web browser uses the HyperText Transport Protocol (HTTP) to extract the required files from the server, and then displays them on your screen.

To create web pages, you will require means, opportunity and motive, and I shall consider each of these in turn.

Means

The easy bit! Since HTML files consist entirely of plain text, you can create them using any ordinary text editor. Edit will do, but some of the more advanced editors such as StrongEd (a004) and Zap (a161) now incorporate features to make the job slightly easier. *(The numbers in brackets are Hensa directory addresses.)*

There are programs which purport to allow you to lay out web pages, much as you would a page in Draw, and which then generate the required HTML. Unfortunately, since I cannot locate any free ones for Acorns, I haven't tried any. However, I can state that while they *may* make the process of writing HTML easier, they will not allow you to produce better looking pages.

Impression users can try Ben Summers' iHTMLtools (d130) which converts Impression pages to and from HTML. It seems to work for simple pages, and should ease the production of those pages containing a lot of text, but it could not handle the complexity of the FSC pages.

After creating the files, you need a browser to check your results. I use the two public domain ones; ArcWeb (c135) and Webster (c164). It is important to remember that the same pages can look quite different on different browsers, so get access to as many as you can. Unless your pages are aimed solely at the Acorn community, you should check them on either Netscape or Internet Explorer.

You do *not* need an internet connection, since the browser can read the files directly off your hard disc.

I have no connection at home, so after developing the pages on my RiscPC, I check them with Netscape on a Unix system at work, make any final adjustments, and then upload them to the Council's server. My pages are therefore entirely untouched by Mr Gates!

Finally, books – there are dozens available, and after looking through many massive tomes with titles like *The Complete Twits' Guide to Producing Web Pages on Windows 99½*, I settled on *HTML – The Definitive Guide* by Musciano & Kennedy, price £22. It is published by O'Reilly and, like their other books, it does assume that you are an intelligent adult and doesn't assume that you are a fan of Microsoft. It has a handy quick reference card and many useful facts about kumquats.

Opportunity

Clearly, for your pages to be continually available, the server holding them must be permanently connected to the internet. If your Acorn is in this happy state, you could try one of the Acorn server packages such as DeltaNet (e006) or NetPlex (e144). I have not had the chance to try either of them.

If you have permanent access through work or academia, you probably already have space on a server, but for the rest of us, the most likely source is our ISP. Demon currently provides 5Mb free with each account, and I believe that Pipex provide 1Mb. There are plenty of companies who exist just to sell you space on their server (they all advertise on the Web!) or you may be lucky enough to find someone like Surrey CC who will provide it for free.

Motive

Aye, there's the rub! *Why* do you want a Web page? Consider the state of the internet, and you will agree that the signal to noise ratio is rather poor. Will your new pages add to the signal rather than the noise? Are you going to duplicate something? Have you checked for similar pages? The world is full of 'personal' home pages with a picture of a girl friend, a list of favourite beers and 'links to Red Dwarf sites'. *It does not need another!* There, I have done my best to dissuade you. I can do no more.

With the aid of the above means, opportunity and motive (and some practice) you will be able to produce *good* web sites. Authoring *great* web sites requires artistic talent (which I don't have)!

Philosophy

HTML pages consist of the text, which you see on the final page, surrounded by tags which define its appearance, together with other tags which show, for example, the location of images. HTML tags consist of letters within angled brackets. A plain tag (e.g. <tag>) switches the effect on, and one with an oblique (e.g. </tag>) switches it off. This concept should be familiar to those of you who remember the golden days of word processing, pre-WYSIWYG!

The following is very important, so please read it carefully. The whole nub of HTML is that it is a content based language. You define areas of text on the basis of their content, not the style in which you want them displayed. So, for example, you may define a line of text as being a main heading. It is then up to the browser to decide which particular font and point size to use. In many browsers (e.g. ArcWeb), this can be changed by the user.

Languages which define pages in this way are called Markup Languages, hence HT**ML**. Some readers may be familiar with SGML which adopts a similar approach.

Time for an example...

```
<h1>Farnham Shakespeare Company
</h1>
```

This says that the text should be displayed in heading style 1. The HTML standard says that this should be the largest size of heading, *but that is all!* The text may be displayed in a different colour, or even made to rotate in 3D! That is not my problem – as an author, I state that this is a main heading and my responsibility ends there. Other useful tags of this sort include for emphasis and for strong emphasis. This is rather like the concept of styles in programs such as Impression, but there is more to it than that.

On my website, at the bottom of each page, you will find my name and the FSC's email address. These are enclosed by an <address> tag, because that's what they are. I have no idea what effect the address tag will have. On many browsers, it will have none at all, but there may be a reader out there who has decided that he would like all addresses to be displayed in heliotrope, and it is not for me to deprive him of this pleasure.

Other content tags of this sort include <cite> (short for citation) which I place around all play titles, <code> for examples of computer code and <blockquote> for long quotations.

If you create pages using only these content tags, your pages will not be very inspiring to look at, but this is not an excuse for not using them. Content tags provide additional information to current and, more importantly, future browsers. For example, someone may write a browser which takes example code (indicated by <code> tags) and formats it using special rules (e.g. using arrows to the program track loops). The name of the game is to generate your pages using content tags, and then use the minimal number of physical tags (e.g. <i> for italic), to achieve the effect you desire.

A final point: many men are colour blind (including myself) and have considerable difficulty with certain colour combinations. For this reason, I suggest that you never specify particular text and background colour combinations, unless you know what you are doing. Either have dark text on a light background or vice versa. In particular, avoid combinations of red and green. If you can still clearly read your pages after changing your display to a grey-scale screen mode, you should be OK.

Basic principles

At last, some HTML! Consider the following example page, and ArcWeb's rendering of it below.

```
<html>
<head>
<title>Hello World</title>
</head>
<body>
<center><h1>Example</h1></center>
Some example text to demonstrate
<!–A comment–>
the simplest HTML page.<br>A new line
</body>
</html>
```

A few fundamental points. All HTML files are contained within <html> tags and are divided into a number of sections. The <head> and <body> sections shown here are needed by all HTML pages and are thus the most common. The head section contains various parameters which apply to the entire page. In this case, there is a <title> which the browser will display at the top of its window. This also appears in AltaVista listings and bookmark lists, for example, so choose it with care and try to make each one different.

The body section contains the meat of the document. Note that, like C source code, all line breaks are ignored. If you wish to start a new line then you should use a
 (break) tag as I have here, or a <p> (paragraph) tag, which does effectively the same thing, but leaves a gap.

The function of the popular tag is fairly self-explanatory. However, this is not the only way of centering things. My main heading line could be rewritten:

```
<h1 align=center>Example</h1>
```

This would have achieved exactly the same effect, so choose whichever approach you are happiest with. This does, however, serve to demonstrate another important point about tags, which is that many of them can have modifiers such as the "align=center" one shown above.

I will finish this month by mentioning some of the other simple tags which can be used to affect the appearance of text.

```
Here is some <em>emphasised</em>,
<strong>strongly emphasised
</strong>, <b>bold</b> and
<i>italic</i> text.
```

Here is some **emphasised**, **strongly emphasised**, **bold** and *italic* text.

Don't forget that although your browser may not produce the same results as above, this does not

matter. For example, your browser may show and <b> as the same, but not everyone else's will. If you want to emphasise something then use and *give your readers the choice!*

Next month, we will cover some more of the common text appearance tags, together with how to add links to other pages and images. In the meantime, if you wish to contact me, my personal email address is:

<address>*rsimpson@ewrcsdra.demon.co.uk*
</address>. ◆

Club News

Acorn Expo '97 in the Netherlands – After the success of Acorn Expo '96, the Big Ben Club (Dutch Acorn User Group) is organising the Acorn Expo '97. It will be taking place on Saturday 31st May 1997 in the Expohall, Hotel Mercure, Nieuwegein from 10 a.m. to 5 p.m. Admission for non-members is fl 5.

There will be exhibitions/promotions by various companies, including Dutch, German and British Acorn dealers, demonstrations by club members, etc. *(NCS will be there! Ed.)*

For more information about Acorn Expo '97, contact Herman Corijn phone/fax: +31 714-080-339 or <bigbenpr@nedernet.nl>.

Homepage: http://www.nedernet.nl/~bigben

Acorn Southeast Show – An Acorn show will be taking place on Saturday 5th July 1997 in Welwyn Garden City, Herts. The Acorn Southeast Show is sponsored by The ARM Club, and supported by both Acorn and Xemplar. A demo party and IRC meet will also be taking place during the show. Information about the show can be found on the Internet at http://www.digibank.demon.co.uk/ or email acornshow@digibank.demon.co.uk.

Arche Acorn User Club is a user group that organises a meeting in Essen, Germany, every two months. Members and guests can exchange their experiences and problems with the Acorn Archimedes and RiscPC. All Acorn users are welcome at the meetings.

More information is available at:

http://www.koeln-online.de/inis/arche/

This site has an excellent link page which includes the only link in the internet to the ArcWorld newsgroup. Anyone can use ArcWorld, a German BBS network, because it runs on a public server.

In addition, there is a forum, a little "newsgroup", where anyone can talk to other Acorn users, or announce news (other meetings, Acorn news and so on).

Sorry, all the web pages are written in German, but take a look at the link page.

Carlos Michael Santillan <cms@koeln-online.de>

Bognor Computer Group meets on the second and last Thursdays of the month at 7 p.m. at Aldwick Royal British Legion Club (next to Rose Green Petrol Station) Hewarts Lane, Bognor Regis, West Sussex. For further information contact: Bernard Veasey, 24 Drift Road, Nyetimber, Bognor Regis, PO21 3NS.

bernard.veasey@argonet.co.uk

Demo party – Revelation is the first UK Acorn demo party, taking place as part of the Acorn Southeast Show on Saturday 5th July, in Welwyn Garden City, Herts. The idea is to get the UK demo scene moving, so we're talking demos and design, with competitions for music, graphics and demos.

This is a chance not only to see the kind of computer graphics your Acorn machine can produce, but it's also an opportunity to show off your coding, music or graphical skills by entering one of the competitions.

The party will be a chance to meet the demo crews, talk coding and design, and check out all the latest releases running on everything from A3010s to StrongARM RiscPCs. The highlight of the party will be the competition, with a category each for demos, protracker music and bitmap graphics. There's something for everyone to get their teeth into!

Full details are available on the Revelation website at:

http://www.digibank.demon.co.uk/party/rev.htm

We'd really like to hear your suggestions for this event. It's completely non-profit-making, and it has been organised purely to encourage the demos, graphics and games scene on the Acorn, so we're relying on your interest to make it a success. If you would like to enter one of the competitions, please drop us an email, so we can gauge the interest in the event. You can contact the Revelation organisers at:

rev@digibank.demon.co.uk

Surrey And Sussex Acorn Users' Group (SASAUG) – Towards the end of last year, Stuart Bell suggested forming an Acorn Users Group to cover the area from South London right down to the South Coast. Due to its central location (and the fact that he lives there!), Horsham was chosen as the best place to hold the first meeting.

This initial meeting in January featured demonstrations by Gordon Taylor (ART) and Chris Evans (CJE Micros) and proved to be a great success with over forty people turning up. As this was easily enough to form a viable group, it was decided to ask for volunteers to form a committee and to start planning for a full programme of future meetings.

So, we'd like to hear from any Acorn developers who would like to come and talk to our group. We would also like to invite anyone interested in joining the group to contact us or just drop in to any of our meetings where you'll always find a friendly welcome. We'd like to see you whatever Acorn you're using, be it a Pocket Book or A305 right up to a 200MHz StrongARM or even a NetStation network computer!

SASAUG will now meet every second Monday in the month except for August. Meetings are held in the Horsham Methodist Church, London Road, Horsham and start at 19:30, finishing at 22:00. For further information, please visit our website at http://www.poppyfields.net/sasaug/ or write to Stuart Bell, c/o Horsham Methodist Church, London Road, Horsham, West Sussex, RH12 1AN.

Entrance to the meetings costs £1.50 at the door, or we have a special offer of £12 for all the meetings up to July 1998!

At our next meeting (14th April), Oregan Developments will be our feature speaker and will be demonstrating their exciting new products.

Geoff Arnold <sasaug.geoffa@argonet.co.uk>

Computing & Electronics Holidays for Young People !!

Scripture Union runs Computer & Electronics Holidays for 12 to 17 year olds (boys and girls) at an attractive school in the Hertfordshire countryside.

14-17 year olds – August 4th to August 12th, 1997

12-15 year olds – August 14th to August 22nd, 1997

For details, contact **Jim Maddox**, S.U. Holidays, 69 Claverdale Road, Tube Hill, London SW2 2DH, phone 0181-671-8761 or email jim.maddox@UKonline.co.uk

Comment Column

2½" hard drive, thank you – I asked last month if anyone had a cheap 2½" IDE hard drive for a friend with a Downs Syndrome child. I've already had several helpful email responses, and some help from Ray Maidstone of RepairZone. I'm picking up my friend's Acorn this weekend, and hopefully it will be converted to HD soon. Although I've replied to each correspondent individually, I'd like to express my appreciation to Archive readers more generally. Thank you.

Dave Wood <dave@sunside.demon.co.uk>

Alsystems' Oak Power-ROM – I am now the proud owner of a Power-ROM replacement ROM from Alsystems and I am now again able to use my SCSI drives, that have of late been giving me grey hairs. (Many thanks to Patrick Herborn for advice and encouragement!)

It all began when I changed to StrongARM and OS 3.7. My trusty old Oak cards (one 8-bit and one 16-bit) had never failed me before, but transfers just crashed everything when I tried to load files onto the Quantum Trailblazer. Also, neither the Conner nor the SyQuest would park and shut down at dismounting.

Reformatting the Quantum on my A3000 (the Oak software does not like the RiscPC) seemed to improve things, but when I tried to transfer more than a certain number of files, it crashed again, just as before.

IFEL kindly sent the latest Oak ROM and that improved things a bit, but not very much. File transfer was still a gamble above 100Mb on the 810Mb Quantum.

The other drives behaved very well indeed, even if dismounting them didn't turn them off – which to me is the best reason to dismount anything – but clicking 'free' space didn't work.

My first StrongARM died when it tried battling with the Quantum – it probably wasn't cause and effect, but who knows?! StrongARM number two has worked without a hitch!

So, after a few tries, I managed to establish contact with Alsystems (thanks Keith et al for sending emails) and the ROM arrived with two discs, one for CDROMs and CDs, and one with a few utilities to get the thing going. In essence, the boot procedure was to load the PowerManager and click on install. Finito!

The !Speed utility failed, but as 'Advanced install' does speed tests, too, it was of little consequence to me!

Also on the discs were a backup utility, CDFS, various documents and the heap of CD utilities you get with your RiscPC.

With PowerSystems ROM, you can set spindown time on any SCSI drive, and it now parks the drives correctly. It also allows a lot of partitioning to be done, but that's not necessary if, like me, you are just upgrading your ROM.

I have no SCSI CD player, nor any SCSI scanner, nor a SCSI printer, so any possible problems with those are beyond my knowledge, but as far as I can judge, this seems to be a very valuable addition for anyone using an old Oak card, even at 50 pounds, all inclusive! (£45 through Archive). I will now not upgrade my SCSI card this millennium!

Tord S Eriksson <tord.s.eriksson@swipnet.se>

Archive around the world – Some years ago, we published a league table to show where, around the world, Archive was being read. Here is the current list of the numbers of subscribers in different countries.

Netherlands	77	Austria	3
Germany	20	Greece	3
Belgium	15	Israel	2
Italy	14	Malta	2
Norway	13	Saudi Arabia	2
Australia	11	Sweden	2
New Zealand	11	USA	2
Ireland	7	Brunei	1
HongKong	6	Cyprus	1
Switzerland	6	Iceland	1
Denmark	5	Japan	1
France	5	Kuwait	1
South Africa	5	Lesotho	1
Canada	4	Luxembourg	1
Oman	4	Namibia	1

Qatar	1
Spain	1
UAE	1

So Archive goes out to 32 different countries outside the UK!

Ed. <paul.NCS@paston.co.uk>

Charity computer adventure – We are still "re-cycling" Beebs donated by individuals and schools for use by (mainly) Downs Syndrome children. The latest batch has proved something of an adventure. Giles Braithwaite of Hungerhill School near Doncaster kindly donated a large consignment of Beebs and Master Compacts, but how to get them all down to Norwich?

I asked on the newsgroups, a couple of times, if anyone was travelling down that way and could transport them – there was no-one, and in any case, Giles had found us far more machines than would fit in a private car.

Robert Dean came to the rescue. He offered to rent a van near his home in London, drive up to Doncaster, pick up the computers, bring them to Norwich and then whiz off back home at dead of night! This was arranged and Rob, with his friend Daren for company, duly set off but, half way up the M1, a passing estate car had a blow-out, bounced off the central reservation and across their path. Rob decided(?!) to get out of the way and 'park' the van on the hard shoulder – which he did... upside down! Transits are not known for their stability when completely empty!

Thankfully, neither of them was hurt seriously, although Daren had a bit of a gash on his knee. The police say they were very lucky to escape with such minor injuries, and when Rob and Daren later saw the remains of the vehicles in the hire company's yard, they agreed. I thank God for protecting them.

Undaunted(!), Rob and Daren set off again three weeks later and completed the round trip successfully. Many thanks to them, and to Hungerhill School for donating the computers. I know I keep saying this, but I enjoy being part of the Acorn family – they are a great bunch of people!

Ed. <paul.NCS@paston.co.uk>

Charity computer transport – Hollyfield School in Surbiton, Surrey has kindly offered to give us about 30 computers and monitors for recycling for charitable purposes. Could anyone transport some or all of them up to Norwich, please?

Ed. <paul.NCS@paston.co.uk>

Charity stall expanding – The charity stall at the Wakefield Show (May 17/18) is getting bigger by the minute. We've already got tons of software and hardware here already, and people will be bringing more stuff on the day, I have no doubt. We are therefore needing more help, please, to run the stall. Even if you could only offer an hour, that would be most acceptable. If you can help, please get in touch with Michael Binns, 15 Redewater Road, Newcastle upon Tyne, NE4 9UD – or just email me and I'll relay the message. Thanks.

Ed. <paul.NCS@paston.co.uk>

Credit card numbers by email – In Archive 10.4 p28, Gary Jones suggested using compression systems as a secure means of emailing credit card numbers. Paul went on to suggest the use of Acorn's Squash system. However, using Squash as a form of encryption may *not* be particularly effective.

Paul questioned "How many criminals are 'Acorn-aware'?". Unfortunately, the Squash module uses a popular, cross-platform compression algorithm – 12-bit LZW. Anyone intercepting the 'squashed' email would have little trouble decoding the contents. As the PRM states, the algorithm is "used by the UNIX 'compress' command" (PRM 4-101ff).

This method may be effective against someone who is not 'determined', but would a casual eavesdropper have access to email-in-transit anyway? The criminal would have had to gain access to a mail server before intercepting your message – this would indicate a high degree of determination to me!

It is also important to remember that possession of a credit card number and expiry date confers a great deal of power. One insecure communication, and you could be left facing a very large bill. Emails to "sales.NCS@paston.co.uk" would seem to invite attention, especially if an attempt has been made to encode their contents.

In my opinion, a true encryption package – such as "Pretty Good Privacy" – is required for conveying these details by email.

Nick Chalk <nickchalk@enterprise.net>

Internet mania? – I have noticed recently that Archive is addressing itself more and more exclusively to members of the internet by, for example, providing only an electronic address for one to procure information, or products, that are not necessarily anything to do with the internet.

I am not on the internet, and do not intend joining, as I have a fear of steep learning curves, and do not feel inclined to invest the time.

John Green, Shrewsbury

Thanks for that comment, John. It is something I had noticed, but because the internet has been such a very positive thing for me, personally, I had failed to think about it from the point of view of those who don't have access to it.

Yes, there is a learning curve but, as time goes by, and as more and more non-technical people are using the internet, the software and hardware are getting easier to handle. Your require less and less technical knowledge to get started. The epitome of this is the Acorn NetStation (OK, I am *trying to sell it!!) where you simply push the smart-card in the slot and you're on the net!*

OK then, all you non-net readers, how can we avoid a monthly increase of your blood pressure as you read Archive? For example, do you want me to print the full name and address of all contributors, instead of just a net address or just "John Green, Shrewsbury"? (Mind you, some contributors may not want their postal address to appear in print, and we're very happy to forward letters to people, if you send them to the Archive office.)

We have no control over other companies who make information available over the net, but is there anything that we at Archive can do to help? Do let us know what you think.

Ed. 96a Vauxhall Street, Norwich, NR2 2SD. (01603-766592) [01603-764011] <paul.NCS@paston.co.uk>

Net abuse 1 – I'm not talking here about deliberate malicious use of the net but more about thoughtlessness – from which even I am not exempt!

Passing on email addresses – Did you realise that it is supposed to be bad form to pass on email addresses to other people? I didn't. If someone asks me for an email address, I have just tended to give it out. I obviously get a huge number of emails, so I have a massive address list. I suppose I'd thought of email addresses more like snail addresses which I give out if someone asks. Mind you, we don't give out phone numbers if people ask us, so perhaps there's a parallel.

Maybe the form ought to be to reply to the person asking for an email address and do a BCC (blind copy) to the person they are trying to contact so that they can get back to them if they want to. I'd be interested to know people's thoughts on that.

Sending large files – Attaching large files to an email, without asking, is clearly not a good idea, but how big is big? I think people's expectations are getting higher and higher, as to what is acceptable, so would you bother asking to send a file of 10 Kb? 20Kb? 50Kb? 100Kb?

(If you do send your views and don't get a personal reply then it's probably because you are one of 50+ who decided to tell me what you think!)

Ed. <paul.NCS@paston.co.uk>

Net abuse 2 – *(This isn't abuse of the net so much as abuse of the English language which the internet's "informal" ethos seems to breed...)*

I'd like to make a comment about the generally poor standards of written communication evident in emails, which can often make them extremely difficult for the reader to unscramble.

Here are a couple of very recent examples (certified true extracts of the originals!):

```
"The 4 pin min din can but use on the
in or the out on the card either to
plug in to a video or camera ect for
recording or from a videoor camera ect
for watcing"
```

and...

```
"There is defiantly a bug there some
whereas I had never sene this happen"
```

What's this? Bugs getting belligerent now?! Phonetics running amok? No names, but the second one's from

an establishment with the word "education" in its title!!

Anyway, I am seriously thinking of becoming a founder member of "CRETINS" (Campaign for Real English To be used In 'Net Scribblings) Wanna join? No more boldly going, or split infinitives for us, up with which I will not put!

Jim Nottingham, c/o <paul.ncs@paston.co.uk>

Pro810 printer driver – In my article last month (10.6 p47), I mentioned that I had been unable to get the 'official' Pro810 printer driver to operate correctly on the PC. I am pleased to say that I have discovered the reason. The installation disc had been corrupted and the OEMSETUP.INF file had been re-created with a 'typo' in the printer name definition. I discovered this quite by chance when I happened to look at the contents of an old WIN.INI file. The printer driver loads and operates correctly on PCs running Windows 3.10 or 3.11. Thus I can now generate my circuit diagrams at 600 dpi on A3 paper without the need to be devious!

Also, I discovered that, with the Pro810 driver selected, MS Word6 allows you to select any bin for the first page of a document, thus getting around the second problem (of headed notepaper) mentioned in the article. As a result, colleagues overheard my 'yippee' and asked if I could load the driver on their PCs. So, at the moment, they think I am a genius and can do no wrong. Oh well, perhaps PCs and MSWord are not so bad after all!

Gerald Chandler, Ashtead, Surrey

QicAddress – Thanks for the complimentary review of QicAddress (10.6 p76) but I was concerned that if anyone was interested, they could not contact me! May I also point out several improvements that have been made since version 1.12?

QicAddress can have access to several address files, and you can set up which of these files you wish to be initially loaded on running.

There is now a facility to sort all the loaded addresses into alphabetical order.

You can have automatic scrolling of the window, thus enabling you to scan up and down the addresses with ease.

Address files can now contain optional telephone, fax and email information, which will be part of the searched data. The appropriate information will be sent, as selected using the preference buttons, if the data is present!

The Acorn Education Centres and Local Education Authority addresses are included, plus the full Archive Fact File by kind permission of NCS!

The latest version is 1.30, and will be sent out to registered users along with a printed manual. If anyone wants a full working copy to try (plus other software), please enclose £1 to cover costs. Thanks.

Robert Lytton, 7 Helmsley Drive, Leeds, LS16 5HY.

Risc User does it again! – The Jan/Feb issue of Risc User magazine once again contains several articles that I would have liked to have had in Archive! Alan Wrigley has written a three-page article aimed to give a good grounding (sic!) in Java. What's all the hype about? Where does Java come from? Where is it going? Next month, he's going to start into Java programming, in anticipation of the day we get Java on RISC OS!

Alan has also been over to San Francisco and has written up his visit to the Oracle Open World exhibition. He has come back with very encouraging news (and lots of glossy pictures) of Acorn's very high profile amidst a welter of world-famous names.

Then there was a fascinating article by Jonathan Finn about the exciting future of Sibelius, both in Acorn's traditional marketplace, but now also in USA. He considers the possibilities for the musical equivalent of OCR – music scanning – currently being worked on (not surprisingly) by Neurotron and Beebug.

Finally, someone called Alan Wrigley(!) has done a four-page interview with Peter Bondar. It is, as you would expect, very upbeat, but it's not just hype, there's plenty of substance. Peter makes it very clear that there are going to be desktop (and laptop) RISC OS (and later, Galileo) machines for the enthusiast market for the foreseeable future. He wants such finished products so that he can put them under the noses of prospective clients. He also values the input from enthusiasts and from the third-party Acorn software and hardware community, which helps to make Acorn what it is.

The only thing that spoils Risc User for me are the awful puns used for sub-headings. The Java article had "What's brewing?" and "ground-work", and the Peter Bondar interview had no less than eight pun-headings based on the word "ART†", including "Their ART's in the right place", "ART and Seoul", etc – you can probably guess the other six.

If you're not a subscriber to Risc User *as well as* Archive then you ought to be or you're missing out. They are, in my view, complementary. Why not agree with a friend to subscribe to one each and then swap over after a few days?!

Ed. <paul.NCS@paston.co.uk>

†The Acorn board has decided that the name "ART" is to be played down from now on, and the whole company is back to being just plain, old, honest-to-goodness "Acorn" – and proud of it!

Understanding the Internet – Paul asked me, in an email, what "encoding is MIME quoted-printable" meant. A good piece of internet software should make this sort of thing transparent to the user – just drag and drop – so who cares how it was encoded, as long as it is correctly decoded before I try to read it. However, for those who like to *understand* what's going on, rather than just blindly using it, here's the explanation I sent to Paul.

"Quoted printable" is a simple MIME encoding. If the character is 7-bit, it is left as is, but if it is 8-bit, it is replaced with an equal sign followed by the two-digit hexadecimal character code.

So a letter "A" will be sent as "A" (as is). The copyright sign © is an 8-bit code character, with ASCII code A9. So, it will be encoded as "=A9", and so on.

(If you see something like "This costs =A3100 +VAT", this should be translated as "This costs £100 +VAT", and it means that your software doesn't support this MIME encoding – the £-sign having been turned into "=A3". Ed.)

The MIME encoding methods are referred to as "Content-Transfer-Methods". There are five common ones, but there are more in development. If your email program allows you to choose, then here is what they mean:

7-bit encoding – The message is NOT encoded (i.e. sent as is). The message contains 7-bit ASCII codes and includes line breaks.

8-bit encoding – The message is NOT encoded (i.e. sent as is). The message contains 8-bit ASCII code characters and included line breaks.

base64 encoding – Very common. Converts each run of three 8-bit bytes into four 6-bit values represented by the ASCII characters. Base64 is useful for converting arbitrary streams of binary data to ASCII, but it has the unpleasant effect of swelling the data size by one-third.

Binary encoding – The message is NOT encoded (i.e. sent as is). The message contains 8-bit characters and does not include line breaks.

Quoted-printables encoding – 7-bit characters are sent as is (raw form). An 8-bit character is replaced with an equal sign followed by the two-digit hexadecimal ASCII code.

Mohsen Alshayef <mohsen@qatar.net.qa>

WimpBasic first impressions – I'm going to be doing a proper review, but Paul asked if I could just give you a quick taster as he thinks this is "a cracker" (his words, not mine!), so here goes.

The very first thing that strikes one on seeing the double-cassette-sized box is that there is precious little space for a manual; and in fact the manual is supplied in StrongHelp format. It also gives instructions on how to extract the text to create a manual to read in the bath! (Note carefully that these instructions are in the ReadMe file on the Applications disc, and not, as stated, in a Help file.) Somewhat to my surprise this works remarkably well. Clares state that a manual in Impression format, and maybe OvationPro format as well (yes, please!), will be made available for downloading from their web site when the manual has stabilised.

After I had followed the HelloWorld tutorial, it was clear that this was a cradle-to-the-grave environment: forget using your favourite editor and template designer – it is all in the package (well, you could use your editor if you really wanted). Forget also some of your BBC Basic because that is not the language used. That, of course, is an overstatement, but there have been some quite radical changes. For example,

there's no more ? indirection – instead, you use:

```
StoreByte MemoryLocation%,value%
```

Have you ever struggled to convert between screen coordinates and work area coordinates (possibly standing on your head in the process)? Well, now you can use:

```
WorkX%=ScreenXToWorkArea(WindowName,
                                    ScreenX%)
```

along with other similar functions. Setting an icon to be faded is also easy, using:

```
SetFade Window:Icon$,Fade%
```

And there are many more changes. Although I have used a mix of upper and lower case in preferred style, you can use what you like: variables are not case-sensitive and the system will automatically sort out case for reserved words.

Obviously, this is in no way a review, but my first impressions are that this is a very exciting development that really will make programming a Wimp application very much easier. For comparison, I leafed quickly through a teach-yourself Visual Basic book (in case you do not know, this is a package that runs on a foreign platform!) because, in the past, people have said that what Acorn needs is Visual Basic: well, I guess that WimpBasic is a very good start in that direction, but has a little way to go as yet.

Peter Bond <peter@sdale1.demon.co.uk>

Doctoring the Wimp – Part 3

Ray Favre

Variable names and windows

Last time, we left our developing !RunImage program (version 0.2) merely able to load itself onto the iconbar and display a menu from there. Our final action was to amend `PROCuser_menuselection()` to enable the application to quit in the normal way from the iconbar menu. That amendment simply changed the variable `finished%` from `FALSE` to `TRUE`, but it also raises an important point about the naming of variables in Dr Wimp.

Variable/function names

Nearly all the variables used in the `DrWimp` library are localised and easily identified because their names are all in lower case and start with a "w". These should not be changed of course. The Dr Wimp variables which appear in the skeleton `!RunImage` program are all in lower case. Therefore, if (when) you need to introduce new variables into your `!RunImage` program, it is easy to avoid potential problems by picking names which do not start with "w" and/or include a capital letter somewhere. So, we will adopt the policy of starting the names (and internal 'sub-words') of our own variables with a capital letter e.g. `CheckIcon%`.

Shortly, we will also find that we will need to introduce our own PROC/FNs, for purposes specific to our application. When naming these, we will follow four policies: firstly, we will put their definitions only in `!RunImage`. Secondly we will list their definitions after all the Dr Wimp user-functions, clearly separated from them by a `REM` divider. Thirdly, we will use function names of the style `PROCfunction-Name` i.e. no use of the underscore character and separate 'words' (if any) in the name starting with a capital letter – except the first 'word'. Finally, in the text, we will refer to them as 'app-functions' collectively.

With the above naming policies in place, it will be easy to see, at a glance, whether a variable/function is a Dr Wimp original, or one of our own creation.

So, what about `finished%` then? Well, it is one of only two Dr Wimp exceptions – it needs to be a global variable. If you examine the wimp-function `PROCwimp_poll`, you will see that it mainly comprises a `REPEAT ... UNTIL` loop which is 'asking the question'. The state of `finished%` is the sole exit condition from this loop, after which wimp shutdown occurs. Thus, our final change last time (to `!RunImage`) causes the application to exit cleanly (via the `DrWimp` library wimp-function) when "Quit" is selected from the iconbar menu. (The other exception is the global variable `NULL`, which we will not be needing.)

Adding windows

For our project, we will need at least two working windows – one to enter the details of a new vehicle

and thus to set up an appropriate record file, and the second to make data entries (and show averages) as fuel is bought and used. In addition, every Wimp application has an 'info' window, so that will make three.

The working windows need to show a mixture of single data items such as:

car registration number
mileage reading
date

and display averages in a similar way, e.g. total mileage, total fuel, miles-per-gallon etc.

Hence, we can cater for all these by using icons in the windows to enter the values and to display the results. This is good news, because icons are much easier to handle in wimp programming than other methods of display.

Window templates

One of the features of Dr Wimp is that, assuming you wish to use only the provided `DrWimp` library, any windows used in an application *must* be handled via a 'window template'. The Dr Wimp package comes with a good template editor – "!TemplEd" by Dick Alstein – although any will do.

The 'info' window

Because an 'info' window is common to nearly all applications, Dr Wimp provides a ready-made window template for it, and the means to customise its contents.

In the Dr Wimp Tutorials directory, you will find `Template1`. Copy this across to rest inside your `!Fuel` application directory, and rename it as `Templates`. Now install `!TemplEd` on the iconbar (it's in the Dr Wimp Utils directory) and then drag `Templates` to it. A directory display will open at the top left of your screen, showing one file within it – called `info`. Double-click on this, and the familiar-looking window will be displayed on the screen. As usual, it contains four lines of text. In reality, each of these is one line of text in one icon – four identical icons, one above the other, placed in the surrounding window.

Although this template does not contain the precise text we want for our application, we don't need to alter it in the template file – although you can if you wish.

Before closing the template, have a look at the top right of the screen where `!TemplEd` has put another small window. Without pressing any button, move the pointer over the four text lines (icons) of the displayed `info` template window. As you do so, the top-right window will show the icon number of the icon beneath the pointer. Make a note of these. (Mine are 4, 5, 6 and 7, from top to bottom, but it really doesn't matter what they are.)

Now close the template (via <menu> and "Close window" or <ctrl-Q> in this case) and load version 0.2 of our `!RunImage` into your program editor. *(It would, as usual, be wisest to work on a copy of version 0.2 in a new directory and/or renamed.)*

The first thing we have to do with any window held as a template, is to load it into our application. Provided this is done after `FNwimp_initialise()` and before `PROCwimp_poll` (and before you want to display the window!) the precise location in the program is not too critical. The loading is carried out simply by adding the line:

```
Info%=FNwimp_loadwindow("<Fuel$Dir>.
                        Templates","info",1)
```

By now, this typical Dr Wimp function format should be easy to follow. The first parameter is the full path name string of the template file in which the required window is stored, and the second is the specific window name string. The third parameter tells the program where to find the sprites used in the window (many of the icons use standard sprites supplied with RISC OS and held in the root directory of `:Resources`) and 1 means the Wimp sprite pool. (0 would mean a user sprite area.) The function returns a handle for the window and the meaningful name `Info%` has been chosen in the above line to store this.

This simple wimp-function action hides an awful lot of routine hassle. Not only are the straightforward physical window parameters loaded (e.g. size, colours) but also any outline fonts used in the template are correctly loaded in and 'opened' ready for use (one 'opening' per font per size) and in a manner which will not conflict with other template loadings or other separate uses of fonts in the application. Similarly, all icons in the window template are correctly loaded and identified to the Wimp. Font handling, in particular, can be tricky to

get the hang of, so Dr Wimp really does a good job in making it painless.

As is normal with 'info' windows, we want ours to be displayed whenever a user presses <menu> over the iconbar icon and then moves the pointer off to the right of the "Info" item on the menu (menu item 1, the topmost item).

Again, this is painless with Dr Wimp as there is a wimp-function to do it. The required line is:

```
PROCwimp_attachsubmenu(barmenu%,1,
                                    info%)
```

This function attaches a sub-menu (or a window) to an already defined menu. The first and second parameters are, respectively, the handle of the menu and the specific menu item to which the attachment is to be made. The third parameter is the handle of the sub-menu (or window) which is to be attached.

Add this new line after `barmenu%=FNwimp_createmenu()` and before `PROCwimp_poll`. If you now save `!RunImage` and run it, you will find that the top menu item now has the usual right-pointing arrowhead and the window will appear as required – albeit still with the text from the template.

Yet again, a simple wimp-function is in the Dr Wimp arsenal to change the text. The wimp-function is:

```
PROCwimp_puticontext(window%,icon%,
                                    text$)
```

This really is self-explanatory! So we need to call it four times – once for each line (icon) in the 'info' window, whose handle is `info%`. You will remember that my icon numbers were 4-7, so I added the following, after `PROCwimp_attachsubmenu()`:

```
PROCwimp_puticontext(Info%,4,"!Fuel")
PROCwimp_puticontext(Info%,5,"To log
                    fuel consumption")
PROCwimp_puticontext(Info%,6,"Ray
                                Favre")
PROCwimp_puticontext(Info%,7,"0.3
                          (17-Jan-97)")
```

You should make the text changes to suit your own wishes, using the icon numbers you noted earlier, if they are different from mine. The only thing you need to watch is that there are in-built text length limits to these four icons which you should not exceed. They are currently (on my version anyway) 12, 42, 40 and 37, from top to bottom. (These can be changed by editing the template.)

Save and run the program again to check that the new text is displayed correctly.

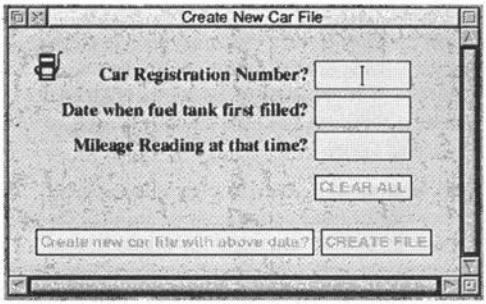
As we will be producing different versions of the application, I subsequently changed the final line of the above to:

```
PROCwimp_puticontext(Info%,7,
      Version$+" ("+VersionDate$+")")
```

after creating two new variables to hold the version number and its corresponding date. A similar change was made to add the version number as text beneath the iconbar icon.

The New Car window

We now come to the first of the working windows; the one to be used when starting a file for a new vehicle. I have called this window "NewCar" in the `Templates` file and we will store its handle in `NewCar%`. My version is on the disc, as the second window in the `Templates` file. The screenshot shows how it appears when first opened during program run (see later).



I am not going to go through the design of this window via `!TemplEd` (but I have a step-by-step account separately if you send an SAE). However, we do need to highlight a few points:

– There are ten icons (0-9), which carry all the text (indirected) and the decorative fuel sprite. The functions provided by Dr Wimp to alter icon text from within the program will, of course, only work if the icon is defined as being indirected.

– I have used background and foreground colours to highlight action icons more prominently (icons 0, 1,

2, 6, 7 and 8). These are set with the 'F-command' in the validation string.

– It is essential to remove any 'K-command' validation string from the three writable icons (icons 0, 1 and 2), otherwise the caret movement may not work as later arranged.

– It might be helpful, for programming, to number the writable icons 0, 1 and 2, as per the template and for the other three coloured text icons to be numbered consecutively (6, 7 and 8 here).

– If you play with the template, be sure that none of the icons is selected in the template display before it is re-saved, otherwise it might not look right when used.

Intended operation

This window will be opened from the iconbar menu, and its three writable icons will start off empty with the caret in the top one. The other three coloured text icons will start off disabled, i.e. they will be 'greyed out' and give no response.

The vehicle details are to be entered by the user into the three writable icons, using keyboard entry. The `<return>` key or `<up/down>` keys will be used to cycle the caret among the three icons at will *whilst they remain empty*. However, once an entry is made in any of the three icons, a validation process on that entry will commence as soon as `<return>` or `<up/down>` is pressed and the caret *will not be allowed to leave that icon* until a validated entry is completed (or the user once again empties it).

Only when all three writable icons hold validated entries will the other action icons be enabled, allowing the user to confirm that a new file should be opened. An alternative option to clear all entries will also be given – although individual entries will still be able to be amended. Once a new file has been opened, all window entries will be cleared, and the display will revert to its starting state.

Displaying the window

Displaying the new window on the screen is straightforward once we have it saved in the `Templates` file. First, the window needs to be loaded, exactly as with the 'info' window earlier, and this is best done in the very next line after that, thus:

```
NewCar%=FNwimp_loadwindow("<Fuel$Dir>
                    .Templates","NewCar",1)
```

Secondly, because we are going to activate this window from the iconbar menu, we now need to revisit that menu, and make a modification to our existing program.

So, find the line which creates `barmenu%` and change it to:

```
barmenu%=FNwimp_createmenu("Fuel/Info/
                              New Car/Quit",0)
```

which just adds an extra menu item `"New Car"`. However, in doing so, it changes the menu position of `"Quit"` from item 2 to item 3, so we also need to change our existing code in `PROCuser_menusel-ection()` to reflect this. Therefore, change the *existing* line `WHEN 2` to become `WHEN 3`.

Our new menu item 2 is `"New Car"`, and when this is selected, we want the new window to open. This is achieved by adding a *new* `WHEN 2` sequence using yet another Dr Wimp wimp-function `PROCwimp_openwindow()`. The new routine is:

```
DEF
PROCuser_menuselection(menu%,item%)
CASE menu% OF
  WHEN barmenu%
  CASE item% OF
    WHEN 2
    REM Item 2 is 'New Car'.
    PROCwimp_openwindow(NewCar%,1,-1)
    WHEN 3
    REM Item 3 is "Quit".
    finished%=TRUE
  ENDCASE
ENDCASE
ENDPROC
```

The general form of the new wimp-function is `PROCwimp_openwindow(window%,centre%, stack%)`, where `window%` is the handle of the window to be opened and `centre%` is 1 or 0, and determines where the window is placed on the screen (1 meaning centred). `stack%` is another window handle (the one to open the new window behind) or −1 to open the new window on top of the rest, or −2 to open it at the bottom. We will be using this function again later in the program.

You should now run the new program to check that the `"New Car"` window opens as expected, but there is a lot more to do before it can be used.

Enabling/disabling icons

From using other applications, you will be familiar with the fact that icons (and menu items) are often 'greyed out' to prevent their use at particular stages in the application and/or if a feature is not available in the version you are using. Dr Wimp provides wimp-functions to do this.

We said earlier that the starting state of our new window would have three of the coloured text icons disabled in this way – so we need to effect this as soon as the window is opened. Immediately after the above `PROCwimp_openwindow()` line (i.e. still in the `WHEN 2` sequence) we simply add:

```
PROCwimp_icondisable(NewCar%,6)
PROCwimp_icondisable(NewCar%,7)
PROCwimp_icondisable(NewCar%,8)
```

The icons concerned are 6, 7 and 8, so there is little need for explanation! (As the icon numbers are consecutive, the above three calls could be equally well made in a simple `FOR ... NEXT` loop.)

Now when you run the program, you will see the effect.

Initial caret placement

We also said that the caret would start off in the top writable icon, which is icon 0, and yet again a wimp-function is provided. Add the next line immediately after the above three:

```
PROCwimp_putcaret(NewCar%,0)
```

What could be simpler to follow?

Key presses

With the window in its initial state, the user is now required to use the keyboard to make data entries. The <return> and <up/down> keys are used in the usual way to signify the end of an entry and/or to move the caret and will also trigger our specific entry-validation and caret control processes.

You will probably be aware that all Wimp programs need a routine to handle user keypresses anyway, which is not always easy to grasp. Once again, Dr Wimp makes this easy and almost invisible to us, via a user-function `FNuser_keypress()`, which is called automatically from within `DrWimp`.

If we don't need to use the keyboard at all – or only want to use it to fill a writable icon – we simply leave this function in its default state, which means it is 'empty' and returns 0. However, if we want to specify some other action to be taken on a keypress (e.g. like some 'second line' validation) then we define that action in the user-function and arrange for it to return 1 when the appropriate keypress occurs.

In our case, we want to use the <return> key (`ASCII 13`) and the <up/down> keys (`ASCII &18E` and `&18F`) to initiate a validation check and to control the caret movement in a particular way. I have therefore modified `FNuser_keypress()` as follows:

```
DEF FNuser_keypress(window%,icon%,key)
      used%=0 :REM Needs to return 0 if
        no keypress is used for action.
CASE window% OF
  WHEN NewCar%
  CASE icon% OF
    WHEN 0,1,2
    CASE key OF
      WHEN 13,&18E,&18F
      used%=1 :REM Needs to return 1
          if keypress used for action.
      PROCvalidate(window%,icon%)
      REM Validate current entry.
      REM If user-entry not valid then
        caret not released from current
          icon. But caret can be moved
                    from 'empty' icon.
      IF Valid%(icon%)=TRUE OR FNwimp_
        geticontext(window%,icon%) =""
            THEN PROCmoveCaret(window%
                              ,icon%,key)
        REM Cycles caret among icons.
      ENDIF
      PROCcheckAllEntries(window%)
      REM Checks if three entries
                              validated.
    ENDCASE
  ENDCASE
ENDCASE
=used%
```

Thus, whenever <return> or the <up/down> keys are pressed when the caret is in icon 0, 1 or 2 of window `NewCar%`, our first new app-function, `PROCvalidate()`, is called. This runs the particular text entry through our extra validation gauntlet, and sets a flag `Valid%(Icon%)` for that icon once a valid entry is achieved – and also copies the validated entry into `Valid$(Icon%)`. (Both these small arrays are

set up in our PROCfuelInit, introduced last time. The reason for the latter array is explained later.)

Once the entry is valid (or if the icon still contains a null string), we cycle the caret to the next icon with the app-function PROCmoveCaret(). We then call another new app-function, PROCcheckAll-Entries(), to see if all three writable icons have their 'valid entry' flags set. When, and only when, all three show valid entries, we cause icons 6, 7 and 8 to be enabled, using the wimp-function called (what else?!) PROCwimp_iconenable(window%, icon%).

Validation

Dr Wimp has made the progress wonderfully easy so far, and perhaps it is only right that we have to stand on our own feet for user-entry validation. (This is not a criticism – it is difficult to see how help could be given with validation.)

With Wimp programs, validation of entries in writable icons is, in fact, much simpler than it might be, due to the very comprehensive 'first line of defence' facilities offered via the icon's 'validation string'. Even with this help though, in our case, a fair amount still needs to be done on the 'second line of defence'.

As these articles are about Dr Wimp, I will not be going through these two validation hurdles in detail. Via version 0.3 of our application on the disc, and using a window template editor, you will be able to see the 'A-command' validation strings I have used for 'first line defence' – and my attempt at programming the 'second line defence' is in the !RunImage listing, which is well-commented. *(I will be happy to produce a separate article on the subject if the demand arrives.)* However, it is sensible to give a brief overview of our needs here:

Vehicle Registration Number (VRN) (icon 0). We can't do a lot here, because the variations are considerable. VRNs usually comprise small groups of capital letters and/or the numbers 0-9, separated by single spaces – and we can allow all these with the validation string (so don't forget that <shift> will be needed to enter letters). Beyond that, we will eliminate leading and trailing spaces and also any occurrences of more than one space consecutively. Further, we will set an arbitrary rule that the total length of the VRN must not be less than six letter/number/space characters in total – but this is easily changed if you own "HRH 1"!

Date (icon 1). We may well, later, want to extract numerical data from the date, so there are many advantages if we fix the date text format rigidly at the user-entry stage. We will use the form "dd/mm/yyyy" – but will allow the user to enter single numbers for day and month, and will automatically add leading zeros to keep the format constant. As we are so near the millennium, there is little choice but to insist on a four-digit year entry. We can therefore restrict the date entries to the digits 0-9 and the "/" symbol, but we need to check for at least two "/" characters, correctly disposed. For the year, we will limit it to the range 1950-2050 and, of course, appropriate date and month range limits. (All this takes a lot of program lines!)

Mileage (icon 2). Here we are talking about the odometer reading, so we can easily restrict ourselves to integer numbers with no more than six digits. It is worth noting that 0 can be a valid entry and needs to be distinguished from an empty (null string) icon.

I have chosen not to alter or delete invalid entries. Rather, the user is told what's wrong – via copious use of PROCwimp_error() – and refused exit from that icon until it is corrected. ("Do it again, boy! Properly this time!")

Creating a file/clearing entries

When the "CREATE FILE" and "CLEAR ALL" icons are finally enabled, the user only needs to click on one of them to take the next step. Yet again, Dr Wimp has an initially-empty user-function automatically called to cover this action – PROCuser_mouseclick(). In our case it needs to be filled with a routine such as:

```
DEF PROCuser_mouseclick(window%,icon%,
                                    button%)
CASE window% OF
  WHEN NewCar%
  CASE icon% OF
    WHEN 8 :REM 'Create File' icon.
    PROCcreateNewFile
    WHEN 7 :REM 'Clear All' icon.
    PROCclearAllIcons(window%)
  ENDCASE
ENDCASE
ENDPROC
```

As this is fairly straightforward, I will leave you to examine the new PROCs in version 0.3 of the application on the disc. In `PROCcreateNewFile`, I have had to anticipate a little of what we will do next time, and you will deduce that we will be naming all vehicle files sequentially as `Car1, Car2`, etc.

Finally, because there is no limit to the craftiness of users, it is necessary to run a quick check before creating a new file to ensure that the user hasn't altered the validated entries *after* the `"CREATE FILE"` icon has been enabled. So, `PROCcreate-NewFile` does this first and wraps his/her knuckles if this effrontery occurs. The icon entries are not deleted though. (Perhaps they should be, as a punishment!) This explains the need for the array `Valid$()`.

Next time

With the above under our belt, the second window will be much easier to incorporate, particularly as the structure of some of the new functions introduced above anticipate this. We also have to introduce a 'dynamic' menu to allow more than one vehicle to be on file.

You can now contact me by email at *rayfavre@mail.zynet.co.uk* – or by post at 26 West Drayton Park Avenue, West Drayton, UB7 7QA. ◆

Map Edit and OS Import

Charles Hill

These are mapping utilities to be used in conjunction with Key Plus datafiles. Map Edit (v1.4 reviewed) is a utility for editing existing Key Plus maps (KPM) or creating new ones from drawfiles.

Creating maps in Draw

The principle is very simple, although considerable experience of using Draw is advised for all but the simplest maps. Each feature of a map, e.g. roads and rivers are drawn. All the parts of a particular feature must be drawn and then grouped together. (Each group should only have one 'layer' and not consist of further subgroups.) The individual groups are treated by Map Edit as different layers, one layer per feature – up to 18 different features including grid lines can be included. The map must be saved to disc before being converted into KPM format.

Once the basic map and features have been converted to KPM format, further editing can be carried out. As well as saving the map as a drawfile, or KPM, the map can also be saved in editable format, rather than as a single file. Editable format is a directory and contains a text file, the map as a drawfile and additional drawfiles which act as the legend for the individual features, e.g. roads, rivers, etc.

There is a facility for entering the latitude and longitude for a map created as a drawfile, although if additional information is to be included in the margins of the map, e.g. explanatory text, scales, copyright information, then the latitude and longitude data must be increased to include this. This is not an easy task, as the map has to be printed, the latitude and longitude on the map measured, and the width of any margin with additional information also measured, and then the margin measurement converted and included as latitude and/or longitude on the overall size of the map.

Once the drawfile has been created, Map Edit allows features to be flagged so that they may or may not be displayed. For example, land and sea can be flagged so that it is not possible to turn them on and off. Other features, e.g. roads and rivers, could be switched on and off as the user requires. A third flag allows features to be switched on or off when the file is first opened, to avoid too much (possibly confusing) detail being shown at once.

It should be pointed out that not all of Draw's features are supported by Key Plus. The following must *not* be included: rotated text, text area objects, non-standard fonts (System, Homerton, or Trinity are recommended), arrowheads in the form of Draw 'end cap' definitions (use small filled triangles instead), any sort of text in the legend pictures.

OS Import (v1.7)

This is a companion utility to Map Edit. It is able to read Ordnance Survey NTF (v2.0) format files and export the information as either drawfiles or KPM.

NTF files are available in IBM format, but these are easily transferred to a RISC OS directory and used from there. They are available as 'tiles', the area of which depends upon the map scale. The sample provided was a Routeplanner (BaseData.GB®) at 1:625 000 (350Kb) with a tile size of 100 000m and the other was a Land-Line.88® 1:1250 (300Kb) with a tile size of 500m. The tiles are expensive – I was quoted a price of £138 per tile plus an annual copyright charge of £10.40 to use the information. This is probably prohibitively expensive for a school unless it is able to access the data under a Local Authority licence.

The following OS Vector products are available:

Land-line® – 1:1 250 (urban), 1:2 500 (rural), 1:10 000 (moorland) including building outlines, roads with names and/or numbers, fences, hedges and walls, water features including high/low water marks and railways.

Strategi™ – 1:250 000 and BaseData.GB® – 1:625 000 including roads, railways, settlement areas, water features, national/county boundaries.

Double clicking on the application installs it on the iconbar. The NTF file is then dragged onto the icon and a dialogue box appears giving the information about the file (OS reference, size, etc). Clicking on import starts the conversion process, and it took about 35 secs for the 1:625 000 scale, and 45 secs for the 1:1250 scale (on a 25MHz A5000). At the end, the file can be saved as a drawfile or KPM.

It should be pointed out that the drawfiles are not identical to OS maps as they only include vector data – only line and text information is included (roads, boundaries, etc), and filled polygon features are not represented.

The main advantage of such a program is that it might enable additional information to be added to an OS map of an area, e.g. information gathered as part of a school project on an area. Map Edit does have a useful feature (available from the iconbar) which will convert an OS grid reference to longitude and latitude. This means that locations named in a Key Plus datafile, together with longitude and latitude coordinates as a field, could be plotted, although on a small scale there would be considerable accuracy problems.

One warning is that OS Import uses a different version of FPEmulator (4.03) and, without this version, my computer froze. I had to alter the run file of OS Import to load the newer version, but once done, there were no further problems apart from the fact that the drawfile created caused Draw to crash if I tried to load it directly or after saving it (i.e. with OS Import still loaded). Resetting the computer cured the problem and the saved drawfile worked without further problems.

Map Edit and OS Import each cost £30 + VAT, or £35 through Archive.

Key Maps

For those with poor drawing skills or lack of time, it is possible to purchase maps from Anglia Multimedia which already have features included. World and Continents, and British Isles and Regions maps were available for review and these cost £22 +VAT each (also available in PC versions). British Isles: climate soils and agriculture, Australia map suite and New Zealand map suite are three more discs available at the same price. There are also two CD-ROMs at £40 +VAT, covering Countries of the World and Counties of the British Isles.

The British Isles and Regions disc (330Kb) contains the following:

A complete British Isles Map

A drawfile map and KPM of the British Isles showing the coverage of the regional maps

Seven regional maps including Wales, Scotland and Ireland

The maps have a range of features including principal railways, motorways, high ground, rivers, lakes and latitude/longitude grid lines.

The Readme file also contains a warning that latitude and longitude lines will not be displayed with versions of Key Plus lower than 2.07. It should also be noted that the maps will not work with datafiles produced before 1992, as these used coordinates based on a different (sprite) map format.

The World and Continents disc (500Kb) contains a flat projection world map, six continental maps (N and S America are separate) together with a sprite and drawfile map of the world showing the coverage of the continental maps. The Continent maps include

rivers and lakes, international boundaries and longitude and latitude grid.

The drawfiles and sprites can, of course, be printed straightaway, but all the maps can be converted to drawfiles with Map Edit and these can then be included in other documents, e.g. DTP. The discs reviewed come with, effectively, a site licence and permission to use the material freely within a single educational institution.

In the next article, I shall review some Key Plus materials for Modern language teaching (Key Français) and make a comparison with the AVP Picturebase CD-ROM, Perspectives Françaises. ◆

Puzzle Corner

Colin Singleton

Puzzle Corner celebrates its century with a blockbuster – you have been warned! This month's quickies – and probably many more to come – are inspired by a fascinating book on numbers (whose title I will reveal some other time!), kindly sent to me by Dr Riha.

But first ... the prizewinners ...

(87) Jewish New Year

A pleasing number of readers submitted very accurate answers to this tricky puzzle. The prize goes to Robert Owen of Colwyn Bay, although his counts for the full calendar cycle are, mysteriously, not precisely the same as mine.

(91) Ladders

Several readers thought this was too easy for the main puzzle – including two who nevertheless did not find the smallest answer! I am pleased to welcome a new name to the Roll of Honour – A. Bryden of Wakefield. Readers who volunteered marks rated this puzzle, on average, 7·4 out of 10.

(92–94) Pennies – Squares – Products

A good response here, although some, inevitably, did not find the 21st Square, and the Products puzzle gave quite a few problems. Among several all-correct entries, the prizewinner is Clive Semmens of Ely. The average ratings for these three puzzles were 7·6, 8·1 and 8·6 respectively.

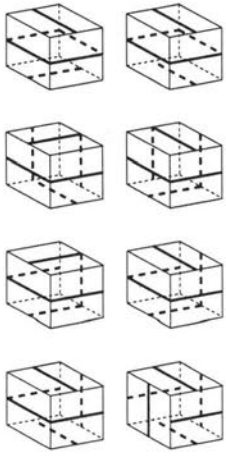
... and last month's answers ...

(95) Back to basics – again

My program has investigated all decimal numbers up to 3 000 000 with all possible other bases. This exhausts the possibilities for all bases outside the range 8 to 14 – but there certainly are further solutions within this range, possibly up to 25 digits long for base 11. More news next month. The table lists all decimal values under 3 000 000 for all possible bases.

4	13
7	23 46 2116 15226
8	1527465
9	445 313725
12	315231
13	43 86 774
14	834
16	53 371 5141 99481
19	21 42 63 84 441 882 7721 9471
21	551 912
22	73 511
25	83
28	31 62 93 961
37	41 82
46	51
55	61
64	71
73	81
82	91

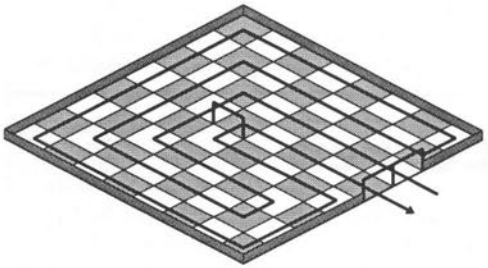
(96) Lined Cubes



The answer given by Hubert Phillips for these equivalent puzzles is eight – as shown. For the diagonal lines, simply rotate each of the orthogonal lines 45° clockwise. You should find that any other solutions are simply rotations of these. The solution set does include one pair of reflections which are, of course, different.

(97) Squarebashing

The minimum number of turns is 14 – and Sam Loyd assures us that there is only one possible route.



(98) Prime and powerful

From the identities $x^3-1 = (x-1)(x^2+x+1)$ and $x^2-1 = (x-1)(x+1)$ we can deduce that the only cube which is one more than a prime is 2^3, and the only cube which is one less than a square is also 2^3. Even if I remove one of the conditions, there is no solution other than 7–8–9.

(99) A Bonus

This question was sneaked in so that N° 100 would be the main puzzle the following month! It is, however, a genuine puzzle – any advance on *UNCOPYRIGHTABLE*?

... and now this month's prize puzzle ...

(100) Century Celebrations!

The Century Dining Club has exactly 100 members, and is arranging a series of eleven dinners at local restaurants where the members will, on each occasion, be seated at ten tables of ten. The Secretary is struggling to devise seating plans to ensure that no two members are seated at the same table on two occasions. The diagram shows an order-4 solution, with 16 members designated A1 to D4, seated at four tables of four on five occasions – every pair of members shares a table once, but only once.

A1 A2 A3 A4	A1 B1 C1 D1	A1 B2 C2 D2	A1 B3 C3 D3	A1 B4 C4 D4
B1 B2 B3 B4	A2 B2 C3 D4	A2 B1 C4 D3	A2 B4 C1 D2	A2 B3 C2 D1
C1 C2 C3 C4	A3 B4 C2 D3	A3 B3 C1 D4	A3 B2 C4 D1	A3 B1 C3 D2
D1 D2 D3 D4	A4 B3 C4 D2	A4 B4 C3 D1	A4 B1 C2 D4	A4 B2 C1 D3

Now, I have to be honest – I don't have an order-10 solution! I don't even know if there is one, though I feel there ought to be. W W Rouse Ball discusses the problem in his *Mathematical Recreations and Essays* and gives solutions up to order-9, but he offers no comment on order-10. I do not recall seeing the puzzle in print elsewhere – surprisingly, since it is certainly an interesting problem. I expect that it will be held open at least one extra month – Good Luck!

... and the quickies ...

(101) Pizza pieces

What is the largest number of pieces into which a circular pizza can be cut with six straight cuts, without rearranging the pieces?

(102) Taxi!

Srinivasa Ramanujan surprised G H Hardy by pointing out that his seemingly uninteresting taxicab number (1729) is the smallest number which is the sum of two different cubes in two different ways. $1729 = 1^3+12^3 = 9^3+10^3$. When asked for the smallest number which is the sum of two different fourth powers in two different ways, Ramanujan did not know. Do you?

(103) Triplets

The four triplets of numbers (14,50,54) (15,40,63) (18,30,70) (21,25,72) each have the same sum – 118 – and the same product – 37 800. Can you find five triplets with this property, with a common product under 100 000?

... and finally ...

Dr Riha has decided, for personal reasons, to 'retire' from regular puzzling and make a dignified exit from the League Table. He has been very helpful to me over the years, and I am sure his influence on this column has not ended. There are now several new names moving towards the top of the Leaderboard – congratulations!

Exponentially Smoothed Average								12-Mth
Brought Fwd		10:2	10:3	10:5	Carried Fwd			Ave
1	80.21	70	0	95	71.10	1	Richard Lyszkowski	87.33
6	52.18	92	88	100	68.23	2	Barry Harrison	73.17
2	72.26	77	33	63	66.38	3	John Greening	72.17
8	47.61	90	81	100	64.32	4	Robert Owen	61.50
3	69.20	90	0	80	64.25	5	Clive Semmens	73.50
4	53.06	76	57	83	60.54	6	Laurence Howe	66.33
7	51.62	48	17	63	48.52	7	Robert Newmark	51.33
5	52.75	77	0	0	40.74	8	Geoffrey Brown	63.17
13	27.71	43	17	95	38.10	9	Rosemary Miskin	39.00
11	35.68	74	0	47	36.98	10	Ed Harris	49.67
12	29.19	0	0	63	27.38	11	Jeremy Morris	38.75
9	37.82	0	0	0	23.23	12	John Banks	41.00
10	36.67	0	0	0	22.52	13	Mike Williams	38.33
14	26.13	59	0	0	22.44	14	Robert Beech	35.75

I must apologise for a couple of errata. Barry Harrison was demoted in the last published League

Table because I accidentally omitted his score for one issue – sorry Barry! And, yes, I do know that 38^2 is 1444, not 7744 as stated in 10·5. Fortunately, this does not appear to have caused too much confusion.

Please send solutions to this month's puzzles (with comments, ratings and other contributions) to me, at 41 St Quentin Drive, Sheffield, S17 4PN, by Wednesday 16th April. ◆

Printers and Printing

Dave Floyd

Epson Stylus A4 Pro

Aneurin Griffiths has a problem with his new Stylus Pro which he is running on an A5000 using !Printers 1.53. When he prints, the image shifts at an indeterminate place on the page. He has tried re-installing the software but gets the same thing. It only happens when he is using 720dpi Super microweave, colour diffused settings, and not when printing grey diffused. After much experimentation, Aneurin is fairly certain that the problem lies in a temporary slowing of data through the parallel port.

It occurred to me that perhaps he hadn't installed a copy of the Acorn patch for !Printers 1.53 and I have sent him a copy in the hope that it will solve the problem, but in case not, has anyone else either had a similar problem or got any other ideas? If so, I will be pleased to pass them on.

HP LJ5 driver

My award for 'hero of the month' goes to Michael Ben-Gershon in Israel who has solved the problem that !Printers had with not defaulting to automatic feed if the manual tray was empty and the printer driver set to manual feed. The method differs slightly, depending on whether you have !Printers in ROM or on the hard disc, and has not been tested on anything other than RiscPCs, so make sure you keep a backup of your original file in case anything should go awry.

On systems with !Printers on the hard disc, look for the file:

```
ADFS::IDE_Disc4.$.Printing.!Printers.
lj.Resources.Messages
```

(The precise name will depend on the name of your hard disc).

Look for the following section:

```
# String to output when manual feed is
selected
MANUAL_FEED:|[&l2H
#
# String to output when auto feed is
selected
AUTO_FEED:|[&l1H
```

Change the manual feed to read:

```
MANUAL_FEED:|[&l0H
```

(it is a zero, not a letter 'O').

Where !Printers is in ROM, look for the file:

```
Resources:$.Resources.Printers.lj.
Resources.Messages
```

Copy it to:

```
ADFS::IDE_Disc4.$.!Boot.Choices.
Printers.lj.Resources.Messages
```

(The precise name will depend on the name of your hard disc.)

Alter this file as above.

You will need to restart !Printers after making the modification. Choosing manual feed will now give the desired result – using the manual feed tray if there is paper in it, otherwise using the cassette.

I am sure all the LJ5L and LJ6P owners out there will join me in thanking Michael for this.

HP DJ690

There is now a pdf for this printer, so hopefully that will solve all the problems that people have been reporting. You can download it from Xemplar's web site at ftp://ftp.xemplar.co.uk/ftp/acorn and we'll put it on the Archive monthly disc.

Glasnost at Hewlett Packard?

Following my comments last month regarding HP's reluctance to part with information about their latest printers, Peter Young wrote to them as he has just bought an 870Cxi for which there is, as yet, no Acorn pdf. They replied by telephone with the following

statement. "It is HP's policy to provide information about their products to any company large or small." They went on to say that if Acorn or CC have trouble getting the appropriate information, they are talking to the wrong people, and they proceeded to give the name of the proper contact within HP which Peter has passed on to both Acorn and CC. With a bit of luck, this may mean that we could soon have proper control over the latest HP lasers that do not have built-in control panels.

Economode

I have enclosed a couple of very short files (and at 36 bytes and 37 bytes they don't come much shorter) for inclusion on the monthly disc that allow rudimentary use of Economode. They are titled 'Econ On' and 'Econ Off'. To enable Economode, double click 'Econ On' then send a blank page to the printer. To disable Economode, double click 'Econ Off' and send a blank page to the printer. The blank page is necessary to enable the command, and nothing is printed on the sheet so it can be reused.

For those who don't subscribe to the monthly disc, the text is as follows, with control characters appearing in []. How you insert the [1B] will depend on your text editor, as <alt-27> (using the keypad keys) does not appear to work on the Acorn.

```
[1B]%-12345X@PJL DEFAULT ECONOMODE=
                                    ON[0D]
```

Save this one as EconOn, and

```
[1B]%-12345X@PJL DEFAULT ECONOMODE=
                                   OFF[0D]
```

Save this one as EconOff, and filetype them as Printout files.

I have tested it with Draw, text and Impression documents, and it seems to work as long as they do not include sprites. If you are going to print a page containing sprites, make sure you disable Economode first. Perhaps someone who has a greater knowledge of the HP printer language than me could improve on these two humble efforts or, failing that, maybe some kind soul would lend me the programming manuals for a week or two?

Other things such as print density can also be configured in this way, and I will try to compile a list of the different commands to allow this. For the above, I am indebted to someone who sent me a disc a few months ago but who didn't put their name on the disc itself, so I cannot credit them.

Which inkjet?

Thanks to all the people who offered to print a couple of test sheets for us. Hopefully, by next month, there will be something to report on the Epson and Canon front.

Multiple printer drivers

Jim Nottingham writes with one of those valuable snippets of information that 'everyone knows' – apart from those of us who didn't! If you find yourself constantly resetting the configuration for your printer, between 300dpi and 600dpi for instance, it is far easier to set up a second copy of the same pdf on the iconbar and rename them both accordingly. If you have a Laserjet 5 driver installed, for example, then simply open the printer control window and drag the Laserjet 5 pdf into it, as you did when originally setting up the driver. You will now have two printer icons visible on the iconbar. Configure them both as you want and name them to give a brief description of their differences, e.g. LJ5 300 and LJ5 600, then save and you're away. Now when you want to change resolution in the example given, you merely have to select the appropriate icon.

Printing speeds

In Archive 8.8, Charles Woodbridge wrote an article outlining the perceived benefits of TurboDriver over !Printers for a Laserjet 4P. Having recently upgraded to StrongARM, he thought that an update was in order using the new versions of both TurboDriver and !Printers, and so he ran the same tests again. Opposite is a table of the results, and some observations from him.

"Some points to note:

"The TurboDrivers are still very fast at returning control back to the computer – up to 4.4 times faster than the Acorn drivers, and actually feel very quick to use. The Acorn drivers feel very quick too, and both drivers are pretty equal at completing the printing at the printer. This suggests that both drivers are pushing the printer to its data transfer limit and internal print speed limit.

"Background printing is vastly improved, as neither of the drivers has any perceptible effect on computer usage during the spooling of the file to the printer

once control is returned, and so continuing work is undisturbed.

"The speed increases over the 600 chip are very impressive for both drivers, up to eight times for the TurboDriver and 6.8 times for the Acorn driver.

"I would still opt for the TurboDriver, not just for speed, but also for the control it offers over dot pattern, lines per inch and resolution, to create high quality images.

"The Acorn drivers are now faster than before StrongARM, but the image quality remains the same – for text very acceptable, for graphics just OK."

StrongARM Figures				
File Information	Acorn Driver Hi Speed Parallel		Turbo Driver Hi Speed Parallel	
	Return Control	Printed	Return Control	Printed
A...256 Grey Sprite - no text (891Kb)	16	83	8 [2]	75 [1.1]
B...Text + Drawfile (12Kb)	19	73	5 [3.8]	79 [0.9]
C...Text (3 pages 1700 words)	57	193	13 [4.4]	193 [1.0]
D...Text + Drawfle + Sprite (246Kb)	20	75	6 [3.3]	80 [0.9]
E...CC Plane (Drawfile)	17	96	4 [4.25]	73 [1.3]
All timings in seconds	Figure in [indicate speed increases/decreases]			
File Information	Turbo Driver results from previous test - using the 600		SA compared to 600 chip using the TurboDriver Results	
	Return Control	Printed	Return Control	Printed
A...256 Grey Sprite - no text (891Kb)	64	116	8 [8.0]	75 [1.5]
B...Text + Drawfile (12Kb)	24	94	5 [4.8]	79 [1.2]
C...Text (3 pages 1700 words)	58	195	13 [4.7]	193 [1.0]
D...Text + Drawfle + Sprite (246Kb)	29	103	6 [4.8]	80 [1.3]
E...CC Plane (Drawfile)	22	83	4 [5.5]	73 [1.1]
Please refer to previous article (8.8.58) for full details of the files.	Figure in [indicate speed increases/decreases]			

Calligraph A4

Out of the blue, my post a couple of mornings ago contained a copy of version 3.21 of the printer driver for the Calligraph A4. Oh joy! There was no documentation to say what had been improved, so the only way to find out was to unpack the printer and find out for myself.

The new version will now automatically default to manual feed if paper is inserted into the slot. This was the first thing I tried, and it fair took me by surprise when the paper began to move.

It will also now print text from Draw without first converting it to path. This also means that it will print Tablemate tables, and drawfiles containing text, dropped into Impression.

`*glp` issued from a task window still locks the machine, necessitating a <ctrl-break>. It does get further than it used to though, providing you with half a status report before falling over.

Thin line Draw circles still lose their 'corners'. I tried the same file on the LJ6P, and although the line got slightly thinner, it was printed all the way round.

Printing text from Edit gives an error message asking for !Printers to be loaded. If you try to print text directly from Zap or StrongEd, the machine hangs, requiring a <ctrl-break>. The Calligraph will now print text if you drag the textfile to the printer icon, however, so at least that is an improvement and allows you to take advantage of the extra text-handling provided by !PrinterDP.

Using the `*LQ_Print <file>` command still refuses to produce anything other than a blank sheet of paper.

It is still impossible to set the size of an envelope. Anything typed into the writeable icons reverts to the default once the window is closed.

The Calligraph now prints 256 grey renderings of sprites containing more than 256 colours if you are in Proof or Truetone mode. In Supertone, it ignores them completely, but as it used to do that in all three, this is certainly a step forward. The quality of sprite printing is still not brilliant, but is acceptable. It is on a par with the LJ6P using !Printers in many ways, but nowhere near what can be achieved with the LJ6P using either TurboDriver, or the PC card and HP's own driver.

The Calligraph handles shading slightly better than the LJ6P/!Printers combination, giving a smoother transition between light and dark areas, but its dot

pattern is clearly visible, printing an image not dissimilar to a painting on canvas. This was improved slightly by producing again in 1200×600dpi (use Proof mode – in Truetone mode, I waited six minutes before pressing <escape>) but the problem was not eradicated. Interestingly enough, there was very little difference in print speed between the Calligraph and the LJ6P when printing the same image from Photodesk. Both returned control of the machine in a matter of seconds.

The Calligraph will now handle irregular Impression frames in Supertone mode. In either of the others, it ignores the irregular aspects and prints the full frame, but in Supertone, I have not been able to recreate the problems that were present in version 3.10 of the driver. Strangely enough, I used the same image as I had tried for the previous test, so it would seem that Supertone will print graphics with more than 256 colours if used from Impression, though I seem to remember that Impression does its own sprite handling before sending to print, and automatically converts them to 256 shades, which could explain it.

On to rotated sprites in Draw, and unfortunately there appears to be no change here. The same 24-bit image was used, and in Proof and Truetone modes, it hung the machine completely, necessitating a <ctrl-reset>. In Supertone, an error reporting that Draw had gone wrong was issued.

Next, I thought I'd see whether handling of dual bins had been implemented. I sent a four page document to print, knowing that there were only two sheets in the main tray and that the additional cassette contained paper. After printing the first two pages, the printer beeped, announcing that the paper was out. The Calligraph icon still said 'printing' though. I brought up the main control panel and switched the paper feed to the additional cassette, at which point the icon changed its display to 'paper out' and would not continue whichever setting I had it on. After switching between them a couple of times, I physically swapped the bins over and set the driver to main cassette again, at which point the driver promptly flushed its cache and announced that it was now 'ready'.

The same happened using the additional cassette as the default. I tried twice more, the first time refilling the selected bin when it ran out of paper, and the second, feeding paper in through the manual feed. Both these times it worked fine. It would seem that in making the manual feed work as one would expect, Calligraph have now implemented a different bug into the bin handling routines.

I have not been able to recreate the problems I had before with printing 1200×600dpi text in landscape, and this could be due to StrongARM. Calligraph have supplied a utility to allow others with problems in this area to get around it. Entitled 'LaserMode', this is meant to buffer a printfile from disc enabling the data to be sent to the printer fast enough. It sounds fine, but for the life of me, I couldn't get it to work unless it is meant to sit next to the Calligraph printer icon and just help the driver out after the printfile has been dragged to the driver icon. Dragging to the !LaserMode icon produced nothing, and double-clicking on the printfile sent reams of garbage to the Laserjet in spite of !Printers not being loaded. Fortunately, Hewlett Packard provide a button on their printer to flush memory and ignore the incoming data stream, or else I could have started a scrap paper merchants.

Another interesting-looking utility that comes with the Calligraph driver is !PrintApp. To use this, you are meant to print to file and put the resulting printfile into the application. Double clicking on !PrintApp then prompts you for the number of copies you require, and churns them out for you in the background. Having placed a printfile into the application and double clicked on it, all I got was an error 'No room for this DIM'. I'm not actually sure why this utility is provided at all, as it seems to be duplicating what the driver does already but as it's there, it would be nice if it worked.

Calligraph have clearly made repairs in some of the most important areas, and anyone who owns a Calligraph printer would be well advised to ask for a copy of 3.21 as it is a definite improvement on 3.10. As for the claims of being able to print anything from RISC OS, however, it is still as close as Windoze 95 is to being an easy-to-use and crash-free operating system!

For the record, the tests were done using a 66Mb StrongARM RiscPC, Publisher 4.09, Artworks 1.7, PhotoDesk 2 v.2.04, StrongEd 4.15, Zap 1.35 and the built-in applications packaged with RISC OS 3.7. As has been pointed out before, different setups and software versions may produce different results.

Useful utility – pdf reader

!Pdf, in spite of its name, has nothing to do with printer definition files. What it allows you to do is browse Adobe Acrobat (a.k.a. portable document) files in RISC OS, and output them to Draw if you want to print them out. It does benefit from a fast processor and loads of RAM, but has been successfully tested on a 4Mb A310 with FPA. The software is very much still in development, and has a few rough edges, but I have found it to work brilliantly on all the Acrobat files I have tried so far, once I had set its Wimpslot to 4Mb. If you want to view Acrobat files, then download version 0.61b from http://utopia.knoware.nl/users/lsmiers/index.html. !Pdf is an Acorn port of xpdf by Derek Noonburg, and Leo Smiers (who did the conversion) deserves much appreciation for his work. *(It is also on the Archive monthly disc. Ed.)*

Finally

You can contact me on DaveFloyd@arcade.demon.co.uk or by writing to Dave Floyd, c/o PO Box 2795, London, NW10 9AY. If you are sending files, please put them on a disc and use the post, as Arcade BBS provide email as a free service, and it is not fair on them to burden their phone bill with large files. ◆

More on StrongARM Tests

Jim Nottingham

The article on informal testing of StrongARM in a practical environment (Archive 10.4 p15) brought in a wide spread of comments from readers; many thanks everyone. The bulk of the interest centred on just how much the StrongARM enhanced the performance of various applications, sometimes to an unexpected and remarkable degree.

OCR speed

For example, my business uses Beebug's Sleuth as a convenient OCR tool but, pre-StrongARM, there were times when it was debatable whether it wasn't easier just to revert to copy-typing. A reader pointed out that now, even with Sleuth's speed/accuracy option set to Careful (giving highly accurate results at the expense of out-and-out speed), the machine simply rockets through the processing at an extraordinary rate. I certainly support that view and, what's more, running two copies of Sleuth in parallel – alternately scanning and OCR-ing – is now perfectly feasible. Having recently seen another firm struggling with a £450 OCR package on a PowerMac, it is quite clear that the Acorn-based system is simply streets ahead of that solution in every respect.

Printing speed

Printing is another area where the improvement is debatably much better than anticipated. With outside help, we have done some very rough and ready printing tests which suggest that, job for job, a RiscPC with StrongARM will produce the goods in a fraction of the time taken by a Pentium-powered PC or PowerMac; 12-20% (i.e. 5-8 times faster) being quite typical on complex pages. We should not read too much into that though, as there are so many system variations outside the province of the processor.

Polarised comments

It was interesting to see the two extremes of readers' comments. On the one hand, I was taken to task for daring to suggest there were areas where Acorn-based solutions do not match up to the 'opposition' and, indeed, if one reads the Windows95/RISC OS comparison on the issue 10.5 monthly disc (a really splendid effort from that prolific author Anon), one might begin to wonder how *any* work gets done on a Windows machine...

I can only reiterate that, despite the fact that the complex graphic referred to in the article would be extremely difficult to prepare on anything other than a StrongARM-powered machine and, arguably, would not be a commercially realistic task if attempted elsewhere, nevertheless, the result still had to be exported to another platform for finishing and printing.

CBT digression

To digress slightly; another major area where, from personal experience, I believe development of the Acorn platform falls many years behind other solutions is in computer-based training – in

authoring, editing and presentation – particularly where video is involved (by "video", I am referring to PAL/NTSC standards, not Replay). On that topic, I was very pleased to see Irlam's Risc TV and Yellowstone's DeskTV becoming available, as I believe they may well have considerable long-term potential in this area.

The other pole

Back to the StrongARM article. At the other end of the scale of reader comments, the survey was very severely mauled for what the correspondent saw as its dubious test procedures, data omissions and general lack of objectivity, rendering the exercise pointless and unfair (to non-Acorn platforms).

Well, there you go, you can't win 'em all! While I don't feel a need to defend the article, or give a blow-by-blow response (many of the topics having already been addressed in the body of the article), there are two aspects which may be of interest.

Which operating system?

Firstly, there was no mention of the operating system used by the various machines involved in the tests. I admit this was an omission, although I was a little surprised at the implication that the OS would make a significant difference to the test results. For the record, the PCs – including the PC card in the RiscPC – used a mix of Windows v3.1x and Windows 95 (none were networked).

Since the tests took place, another of the PCs has been upgraded to using Windows 95, as has the PC card, so we have repeated the survey on those machines to gauge the difference. "Not a lot", as the man would say... The speed change on the eight test points varied between −18% (faster) and +7% (slower!), the average being −8%, suggesting that the version of OS used does not significantly affect the overall observations and conclusions.

	System	OS/Compiler	CPU	(MHz)	MIPS	Prices (ex VAT)	MIPs/£k	MIPs/MHz
1	DEC AlphaServer 8400 5/300	UNIX V4.0	DEC 21164	300	464.8	c. £100,000	5	1.5
(=1)	*DEC AlphaServer 8400 5/300*	*UNIX V4.0*	*DEC 21164*	*300*	*457.2*	*c. £100,000*	*5*	*1.5*
2	Dell Dimension Pro150	NT 4.0 srvr	Pentium Pro	200	446.9	£1,900	235	2.2
(=2)	*Dell Dimension Pro150*	*NT 4.0 srvr*	*Pentium Pro*	*200*	*419.5*	*£1,900*	*221*	*2.1*
(???	**RiscPC + following wind!**	**RISC OS**	**ARM SA110**	**287**	**367.0**	**£980**	**372**	**1.3)**
3	DEC Alpha 600 5/266	OSF/1 V3.2c	21164-EB5	266	366.8	£24,000+	15	1.4
4	DEC Server 2100 5/250	UNIX V3.2b	DEC 21064	250	360.4	£45,000+	8	1.4
5	Dell XPS Pro 200n	NT 3.51	Pentium Pro	200	312.4	£1,250	250	1.6
6	DEC 3000/900 AXP	OSF/1 V3.0	DEC 21064	275	291.9	£37,000+	8	1.1
(=3)	*DEC Alpha 600 5/266*	*OSF/1 V3.2c*	*21164-EB5*	*266*	*290.0*	*£24,000+*	*12*	*1.1*
7	Micron Pro Magnum+	Windows NT4.0	Pentium P6	200	275.7	£1,200	230	1.4
8	DEC 200 4/233	OSF/1 V3.2	DEC 21064A	233	245.8	£10,500+	23	1.1
9	DEC Alpha 250 4/266	OSF/1 V3.2c	———	266	226.2	£15,000+	15	0.9
10	Pentium P6-200	Solaris x86	Pentium P6	200	220.7	£4,000	55	1.1
11	DEC 10000/610 AXP	OpenVMS V1.0	DEC 21064	200	214.8	c. £100,000	2	1.1
12	SGI Indigo2	IRIX 6.2	MIPS R10000	195	214.4	£12,000	18	1.1
13	**Acorn RiscPC**	**RISC OS**	**ARM SA110**	**200**	**204.1**	**£980**	**208**	**1.0**
14	DEC 7000/600 AXP	OSF/1 V1.3a	DEC 21064	200	203.3	c. £70,000	3	1.0
(=12)	*SGI Indigo2*	*IRIX 6.2*	*MIPS R10000*	*195*	*202.9*	*£12,000*	*17*	*1.0*
15	Power Macintosh 7500	MacOS7.5.3R2	PPC 604	132	196.7	£1,000	197	1.5
(=9)	*DEC Alpha 250 4/266*	*OSF/1 V3.2c*	———	*266*	*196.0*	*£15,000+*	*13*	*0.7)*

I contacted Vareck Bostrom who submitted the tests for the Dell PC at position 2 and he says that, initially, he used "somewhat aggressive optimization on the Intel reference C compiler v2.1.4" and then "I did a fair amount of work trying to optimize it." What is more, he has since up-clocked the processor to 233MHz and used further optimization techniques and produced over 570 MIPS!

Acorn used their own compiler to test the StrongARM, so I asked William Turner who did Acorn's tests and he told me that he just used the bog-standard Acorn C compiler. He also told me that ***anyone*** *can submit a test result to Al Aburto <aburto@nosc.mil>. Does anyone fancy a bit of optimisation and running their StrongARM up to 287MHz for a few minutes for us? Cheating? No, just wanting to compare like with like! Ed.*

"Not top-of-the-range"

The second aspect to be discussed is that a Pentium 166 is not a top-of-range PC and, for the tests to be meaningful, a Pentium 200, or better still a Pentium Pro 200, should have been assessed (as might the MMX variants). Whilst I fully agree with this view, the original survey was necessarily restricted to machines actually used by ourselves and our business associates. Whether that limitation negates the value of the tests is for the reader to decide.

For example, it may be considered reasonable to extrapolate the test results for the PCs, and suggest that, erring *well* on the pessimistic side, a StrongARM-powered machine would still be some 2½ times faster than a Pentium 200 machine on these tests.

However, how would a Pentium Pro 200 fare? Just before the article went to press, it was reported that PPro200 machines had started to appear in the benchmark web page with scores of 312-450 Dhrystone MIPS, *well* ahead of the StrongARM's 204 and, in at least one case, also ahead on MIPS/£, although that report appears to be contradicted by a snippet on the issue 10.5 monthly disc.

(Yes, StrongARM has indeed been usurped by the PPro200 and others, and has dropped to 16th place. Mind you, five of the listings in the top twenty are for identical computers, but with minor setting up tweaks, so the StrongARM is effectively 13th. Here are the figures including calculations of MIPs per thousand pounds and MIPs per MHz. Ed.)

I am keen to resolve all these imponderables by repeating the tests on a PPro200 machine but, without external help, that is not going to be possible. So I would ask if any reader has access to a PPro200 PC, or even a Pentium 200 machine, and is willing to extend the tests on our behalf? If so, I would be grateful if he or she could get in touch with me at my snail-mail address (or email via NCS). Corel Draw will need to be available, and the actual tests take around 15 mins to perform on each machine.

I've done a limited straw-poll of local dealers and PC users to try to get a feel for why these top-of-range machines do not *appear* to be more widely used. From, admittedly, a small sample, I get the impression that the primary reasons are two-fold. Firstly, it seems that reliability is a very real concern, with various tales of woe. Indeed, one Pentium 200 machine was rejected as being virtually unusable, while the Pentium 166 PC used in the tests is proving to be a very unreliable platform. Can anyone add anything to this discussion?

The second reason comes under the heading of buyer-expectation. It seems that, although some PC-users are buying the higher-performance machines, others may not be *upgrading* to the higher-specification processors on the grounds of cost and hassle set against the likely performance improvement. This is an interesting point and leads me to wonder, had the StrongARM upgrade (at £249) not become available, would the same number of RiscPC users have upgraded to ARM810 from ARM610/710 (at £175/£100)? In terms of performance improvement per pound, perhaps not...

Reverting to the original tests, the single set of Corel Xara results came in at a very late stage and were simply added to the table without comment. Two readers pointed out that, on the face of those numbers, Xara appears to be some 3 times faster than Corel Draw on identical tests, and on the same machine. Computer Concepts (sorry, I mean *Xara*) say this is to be expected, because Corel Draw was written in "slow C++" and Xara in machine code, optimised for 32-bit work – fair enough.

No one has come up with any ideas as to why saving and loading files on the PCs took an inordinate time compared with all Acorn machinery. However, a reader helpfully sent in a very clear explanation for the large differences in file size for the same vector graphic saved in different application formats. It appears this is due to vector graphic packages tending to store information in blocks of fixed size so each block may well contain substantial padding. File size ratios of 2:1 are not uncommon (as we found) while the ratio for DXF-format files, for instance, can be much higher.

Thank you again to all readers who sent in comments and information. I'd be happy to keep this correspondence going and, if any reader(s) can help with further tests on other machinery, please do get in touch. ◆

Jim Nottingham, 16 Westfield Close, Pocklington, York, YO4 2EY.

Help!!!!

Acorn customer success stories – The Acorn Group is enjoying greatly increased confidence among both developers and customers, with new products like the StrongARM processor for the RiscPC, and the Acorn NetStation. As part of the Acorn Risc Technologies marketing plan, Chris Cox has commissioned me to survey the Acorn scene, and identify instances worthy of case studies. The best of these will then be written up for publication as customer success stories – notably on the ART website, in the section "Acorn in Action". Some case studies may also be written up for publication in magazines and newspapers.

We are looking for instances which represent best current practice using Acorn and third-party products – both hardware and software. Naturally, those using current model Acorn computers will be of particular interest – and especially those leading edge instances using (or intending to use) StrongARM processors. However, examples using earlier Acorn (RISC) machines in demanding or unusual situations will also be worth mentioning.

Of course, in asking third party developers, we hope and expect you to mention instances which use your own products to advantage! Nevertheless, if you should know of interesting applications of other Acorn and third party products – either running on the same machine, or completely different instances – we would like also to hear about them.

What we are looking for initially is just brief details on each – enough for us to judge their merits. As well the model of Acorn computer concerned, any third party product should be mentioned, and whether it is a standard product or specially developed. Please mention as many separate instances as you think worthy of note.

Gordon Taylor <gordon@thermal.demon.co.uk>

Basic program, please? – Could anyone write me a program (Basic preferred) to produce a full permutation of nine numbers (all 362,880 of them), please?

John Whitehead <ajwhitehead@argonet.co.uk> or 01373-813336

Charity computer transport – A school in Surbiton, Surrey has kindly offered to give us about 30 computers and monitors for recycling for charitable purposes. Could anyone help to transport some or all of them up to Norwich, please?

Ed. <paul.NCS@paston.co.uk>

Ovation – Clicking on an Ovation file on the hard disc (without Ovation on iconbar, but with Ovation pinned on Pinboard), produces the message, "Buffer overflow", yet loading the *same* file from floppy works OK! It also works OK if I load Ovation from the Pinboard first, and then double-click the chosen file icon. Any ideas, anyone?

Alex Cessford, 30 Belvoir Crescent, Nottingham, NG13 9HU.

PD database? – Does anyone know of an alternative to PowerBase? It eats up memory storage for multi-line fields used in any database created with the application.

Roger King, Guernsey

Powertec SCSI ROM – I recently fitted this ROM to my Morley Cached board and really struggled to get it working (the biggest problem was !BootDECD for the Cumana CD-ROM). However, in the end it all worked fine – until I added another slice! Although I changed nothing – the board was in the same slot etc – the machine crashed. I finally solved the problem by putting the SCSI board in the top slot of the backplane. Now it's all working again.

(Answers on a postcard, please! Ed.)

Brian Scott <BrianScott@arcade.demon.co.uk>

SCSI/StrongARM power-on problems (10.3 p57) My problem was surprisingly solved when I added an additional slice to my RiscPC. Where previously I had had to restart the computer, now it runs through the boot sequence with no problem at all.

So I swapped the four-slot backplane for the old two-slot – and the problem re-appeared! Is it that the

extra slots are giving that little extra time for the discs to get up to speed? Those more knowledgeable may be able to give an answer.

Brian Scott <BrianScott@arcade.demon.co.uk>

Voice controlled keyboard input – I have recently been diagnosed as having motor neurone disease, causing severe paralysis. I have very little movement, so what I need is voice controlled keyboard input. Does anyone know if it's possible with an Acorn yet? (You can do it on a PC!) It would make such a difference. Can anyone help, please? Thanks.

Tony Kelly, Llanwrda.

Basic and Assembler Hints

Mohsen Alshayef

Mohsen sent these in as a series of 'hints and tips', but it's a whole article-worth as far as I'm concerned! Ed.

Basic and the Boolean operators

There seems to be some confusion relating to the result of using the operators AND, OR and NOT in BBC Basic.

Basic will work on all expressions as bit-wise values, i.e. 0s and 1s, and use Boolean operations on them.

However, programmers start mixing these with the truth values. The reason for this is that Basic allows the programmer to use these operators to test for conditions, i.e. use them in relational (assignment) values testing.

Testing and truth value are done with the Basic keywords IF, WHILE and UNTIL.

An example of a standard bit-wise operation:

```
10 Num1%=%1011
20 Num2%=%1000
30 result%=Num1% AND Num2%
40 PRINT result%
```

This will print the value 8 (%1000). This is how Basic works with the AND operator.

Now for another example:

```
10 Num1%=1
20 Num2%=2
30 IF Num1%=1 AND Num2%=2 THEN PRINT
                                    "OK"
```

This will print "OK" because Num1%=1 is true and Num2%=2 is true. It is here where people get confused and start asking why AND doesn't always work with IF.

How does Basic do it then? The answer is simple. We will go step by step:

1. First Num1%=1 is tested. It is found to be true, so Basic assigns TRUE to the first expression. (1st expression becomes –1).

2. Then Num2%=2 is tested. It is found to be true, so Basic assigns TRUE to second expression. (2nd expression becomes –1).

3. Now Basic does a bitwise (Boolean) AND of the results of both expressions. i.e. –1 AND –1 (TRUE AND TRUE). This gives a result of TRUE because (–1 AND –1) gives –1 (check that by converting to bits).

From the above, you will see that Basic will eventually treat the expressions as Boolean values, because, fundamentally, the AND operator can work on Boolean values only. If Basic encounters relational values in the expression, it will first convert them into Boolean values. Basic uses the truth values TRUE and FALSE (-1 and 0) when converting.

There is one more thing that can be learnt from the above. As you could see, Basic has to convert BOTH expressions. This is very important to remember – well, how else could it perform a Boolean AND operation on two numbers?

What confuses programmers is that they encounter errors, sometimes unexpected errors, when using the AND with IF, or with any statement which works on truth values, like UNTIL and WHILE. Here is an example:

```
10 num%=0
20 IF num%>0 AND (100/num%=2) THEN
                          PRINT "OK"
```

The above will give an error "Division by zero at 20". Why? Many think that this should not happen, because when Basic evaluated the first expression, "num%>0" it should have ignored the rest of the line because num% is set to 0 at the start (line 10), and the result of the evaluation should have been FALSE for "num%>0".

The expression "num%>0" was indeed evaluated as FALSE, but Basic will not ignore the rest of the line. Basic sees an AND operator, so it must evaluate the expression after it, then perform the Boolean AND operation on *both* expressions. What happened, is that when Basic came to evaluate (convert) the second expression to a truth value, it failed because it was a division by zero.

If you can't always remember how Basic treats the Boolean operators when used with IF, UNTIL or WHILE control statements, then avoid using AND with them. The above example could have been written as:

```
20 IF num%>0:IF 100/num%=2 THEN PRINT
                                    "OK"
```

Basic Assembler EQU and DC directives shortcuts

We all know that the directives DCB, DCW and DCD can be used as short-hand for the directives EQUB, EQUW and EQUD, respectively, in Basic assembler. All of this is explained on page 362 of volume 4 of the PRM.

The manual indicates that the directive DCS can be used as a short-hand for the EQUS directive, but unfortunately, this will not work.

However, what the manual does not say is that there are even better and shorter shorthand directives for storing bytes or strings in memory.

The "&" ampersand directive

The "&" sign can be used to replace the EQUD and DCD directives, and will define a 4-byte integer (one word) of memory.

Examples:

EQUD 0	can be written as	& 0
EQUD &80	can be written as	& &80
EQUD –1	can be written as	& –1
EQUD address%	can be written as	& address%

The "=" directive

The "=" (equal sign) directive can be used as a short-hand for the EQUB and EQUS directives. If the expression after "=" evaluates into a string, then a string is stored in memory. If the expression evaluates into a number, the LSB byte (lowest byte) of the number is stored in memory.

Examples:

EQUB 0	can be written as	= 0
EQUB &D	can be written as	= &D
EQUB byte%	can be written as	= byte%
EQUS "Hi there"	can be written as	= "Hi there"
EQUS text$	can be written as	= text$

Unlike the EQUB and EQUS directives, the "=" directive must start on a newline or after a colon. EQUS and EQUB can be written immediately after a label, but this is not allowed with the "=" directive.

There is no shorthand alternative for the EQUW directive other than DCW.

It is very strange that the PRM does not explain this properly, although it tried on page 4-362 by mentioning at the end of lines 2 and 11 that (DCB and =) are the same, but it failed to mention that (EQUS and =) are also same.

I hope that others can find more of these shortcuts.

Basic Assembler ALIGN directive

We all know that the Basic assembler ALIGN directive is used to align P% (and O%) to the next word (4 byte) boundary. This is because ARM instructions are 32-bit (4 byte) long, and must start on a word boundary.

However, it seems, on observing many of the assembler listings in your magazine and other magazines, that the ALIGN directive is being misused or let's say over-used. Let's look at a typical example:

```
1000 ......
1010 EQUS "Hi"
1020 EQUB 0
1030 ALIGN
1040 MOV  R0,R1,LSL #2
1050 .....
```

The ALIGN at line 1030 is unnecessary. The reason for this is that the Basic assembler will always ensure that an instruction is assembled and stored in memory

at a word aligned address, i.e. the assembler automatically aligns P% (and O%) before storing the assembled instruction.

Therefore, an ALIGN is not required if it is followed by an instruction.

ALIGN is still required if no instruction follows it, or the directives EQUB or EQUS are used at the end of the listing. This is will ensure that the size of your object code is multiples of 4, and hence appending another code to it using, say, a filing system operation, ensures that your appended code starts on a word boundary address.

Operators priority and functions in Basic

Each operator in Basic is assigned a priority. When an expression is being evaluated, the priority determines the order in which the arithmetic operators are executed. Of course, we all know that.

The list of priority is given on page 32 of the BBC Basic Reference Manual.

The manual says that "FN" (functions) is priority 1. What is not explained in the manual, nor is it indicated anywhere, is that when the operator "FN" is assigned priority no. 1, as shown on page 32 of the manual, what is meant is not only "FN" as in DEF FN (i.e. functions), but also all internal Basic functions.

In other words, internal Basic functions such as COS, TAN, LOG, RAD, SQR, etc, are also considered highest priority and will be executed first. By the way, Basic has a total of 64 built-in functions!

For example:

```
PRINT SQR 2*2
```

will give the result 2.82842712 and not 2 as you might suspect, because the function SQR is higher priority than * and will be executed first. i.e. Basic treats it as (SQR 2)*2.

So keep this in mind when using Basic internal (built-in) functions.

Mohsen Alshayef <mohsen@qatar.net.qa>

Starting StrongED – Part 2

Roger King

BaseMode

Situated within the StrongED application directory is a file named BaseMode. This is the mode that lies underneath any other mode provided by the application. This file sets up headers, footers, bitmap fonts, keyboard shortcuts, date structure and user-defined macros.

We will now examine sections of the BaseMode file, and alter some of the variables which have been supplied as standard. Before starting to alter the BaseMode file, be sure to make a copy of this file and store in a safe place. If you then make an error in entering data into the BaseMode file, you will have the original to hand. StrongED scans the BaseMode file each time that the application is loaded onto the iconbar. If there is an error in the BaseMode file, StrongED will fail to function correctly. A message is generated if an error has been encountered in the BaseMode file.

Transposing two characters

The screenshot below shows a small section of the BaseMode file. You will see that the command to transpose two adjacent characters is ^T, i.e. <ctrl-T>. Note that the line commences with a # character and is greyed out. This means that this particular key-board shortcut is not currently available for the user.

```
        ^Q          KillView
        ^⇧Q         KillStrongED
        ^R          Pop
        ^⇧R         PopAll
        ^S          SwapcaseChar
        ^T          ViewToTop
#       ^T          Transpose(-2)
```

Users of Impression will be familiar with the command <ctrl-shift-Q> to transpose two adjacent characters, so let us change StrongED's shortcut key to this particular key combination.

Start-up StrongED and double-click on the BaseMode file to load it into the application. Scroll

down the file until you see the seven lines of data shown in the above drawing. Note that the shortcut <ctrl-shift-Q> is currently assigned to kill StrongED from the iconbar.

Place StrongED's cursor to the left of the Ctrl character (^) and drag the mouse right with the <select> button depressed until the Q character is reached. The three characters should now be highlighted in inverse video (white characters on a black background). Now place the cursor to the right of the ^T in the Transpose(–2) line, and delete the two characters. Press <ctrl-C>, and the inverse video block will be copied into position on the Transpose(–2) line. You will see that the ^⇧Q command still exists in this particular area of the BaseMode file – it is assigned to kill the StrongED application.

As two shortcut commands cannot be assigned the same key, it is necessary to put the Kill StrongED shortcut out of action (a dangerous key shortcut anyway, as the application will quit the iconbar without any chance of saving your work). Place the cursor to the left of the first tab setting of the KillStrongED line and type in a # character. This line will then be greyed out. The option to kill the current StrongED view (^Q) has also been rendered ineffective by placing a # character at the start of the line. Note that the ^S function, to change the case of the character at the cursor, uses the same shortcut key as Impression.

If you browse through the BaseMode file, you will see the shortcuts offered by other key combinations. If you alter any of these shortcuts, make sure that they are unique to a particular key assignment.

```
#·····^Q·····KillView
#·····^⇧Q·····KillStrongED
·····^R·····Pop
·····^⇧R·····PopAll
·····^S·····SwapcaseChar
·····^T·····ViewToTop
·····^⇧Q·····Transpose(-2)
```

Once you are sure that the key assignment has been set up as shown in the diagram above, you can re-save the file to disc. The new shortcut will not come into action until StrongED is quit from the iconbar and reloaded again.

Date and time

Date and time formats are also held in the BaseMode file. As supplied, they are as shown:

```
→^D,^D⟵DateAndTime ("%DY.%MN.%YR")
→^D,^T⟵DateAndTime ("%24:%MI")
→^D,^W⟵DateAndTime ("%WK")
```

The formatting of date and time strings follows the conventions laid down by Acorn Computers in their manuals. Issuing the command Ctrl-DD will insert the current date into a StrongED window. Ctrl-DT will enter the current time and Ctrl-DW will insert the current week of the year. My own preference for the date format is shown in the drawing below:

```
^D,^D⟵DateAndTime ("%ZDY%st %ZMO, %CE%YR")
```

This will enter into a StrongED window the date as: 26th January, 1997

Macros

At the bottom of the StrongED BaseMode file is an area where macros (shortcuts) can be stored. The diagram below shows this area with a simple macro inserted. The construct of a macro is tab then the shortcut combination, another tab and finally the full string which you wish to assign to this particular macro.

```
Shortcuts
⟵`ncs⟵Norwich Computer Services\n\iNorwich\n

End
```

A macro is a shortcut to a string that can be entered into a StrongED window. If you view the current macros supplied with StrongED when you receive the application, you will see that three or four macros have been set up to insert the programmer's name and address and email data into a StrongED window. You can, if you wish, delete these particular macros and install macros of your own choice. In versions of StrongED prior to 4.15, the definer used for the macro strings was the $ character, whereas, in versions 4.15 and later, it was been changed to the <`> character (immediately above the tab key on the keyboard). This has the advantage over the $ character in that the <shift> key does not have to be depressed to enter the start of the macro. However, you can select any character you wish to define the start of a macro, and even have different macros starting with different characters.

Macros may contain the formatting characters \n and \i (normally used together). The characters \n will cause a new line to be generated. The characters \i will generate an indent, providing that the macro has started from a tabbed or indented position on a line. This combined function is most useful for addresses.

You can add to this area of the BaseMode file as many macros as you wish. Each macro must commence on a new line. The only stipulation is that each macro must have assigned to it a unique shortcut string. A convenient macro for one's own name and address is `me. As soon as this macro is entered into a StrongED window, the macro will expand to display your name and address. Note that macros are case specific. In the above example, if you were to enter `Me, the macro would be ignored.

The Learn function

As well as macros, StrongED also offers a learn function. If you want to type the same string, repeatedly, into a text file, you can ask StrongED to learn the sequence of characters. The learning process is initiated by pressing the key combination <shift-f9>. The word 'BaseMode' on the Info Bar will then change to 'Learning'. You can then enter a text string of up to a maximum of 250 characters, including tabs and return codes. When you have finished entering your string, press <shift-f9> once more. This action informs StrongED of the end of the learn string.

Whenever you require the learnt string to be entered into the text, press <f9>. The text will be displayed exactly as formatted in the learnt string. Only one learnt string can be held in memory at any one time, so that it is more useful for the learn function to remember a really long string that you intend to use regularly within a document. For a short string, it is probably wiser to use StrongED's clipboard.

Headers and footers

At the top of the BaseMode file are two lines that are set up to print headers and footers. The supplied PrintHead function includes the full pathname of the file, and the date and time that the file was printed. The pathname is left-justified and date and time are right-justified.

The PrintFoot function will centre-justify the page number at the bottom of each printed sheet.

The option to print headers and footers on every document is controlled from StrongED's Mode Choices.Misc pane.

Bitmap fonts

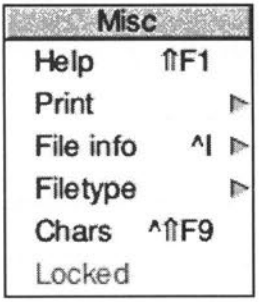
Inside the StrongED application directory is a directory named Bitmaps. If you examine the contents of this directory you will see five sprite files displayed. They are named, in alphabetical order as: Ctrl, PC, Script, System and X. You may load these sprite files into Paint to examine them. You will see that there are two files in each sprite file window: 8*16 and 8*8. The 8*8 bitmap fonts can be used by StrongED in high resolution modes. This choice is obtained from the Mode Choices.Display pane.

The default bitmap font used by StrongED is System. This bitmap font is assigned near the top of the BaseMode file. You may like to change the bitmap variable in the BaseMode file to see the effect of using PC, Script and X bitmap fonts. On no account attempt to use the Ctrl bitmap font as the default. This font is only used by StrongED to display embedded Ctrl characters in foreign format files that are loaded.

StrongED's main menu

We will now explore the contents of StrongED's main menu.

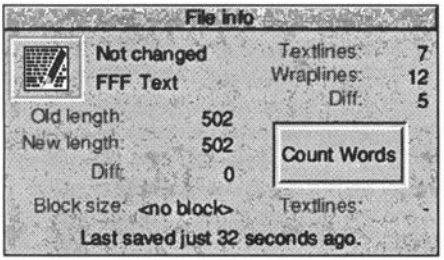
The first option on the menu is the Misc choice. This is shown in the drawing below:



The first option relates to StrongED's Help application. Press <shift-f1>, or alternatively click the <select> button over the icon on the left-hand side of StrongED's toolbar, to load the application.

The Print option allows you to include headers and footers and also to set up the page width and length of the document you intend to print.

The File info box can be displayed with the key combination <ctrl-I>, or alternatively by pressing the key combination <shift-select>, over StrongED's Help tool. The File info pane is shown below:



This pane displays useful information about the file that you are currently working on. It also informs you of the last time that the file was saved to disc. Clicking <select> on the Count Words icon will inform you of the current word count of the document.

Pressing <shift-adjust> on StrongED's Help icon on the toolbar will inform you of the ASCII code (in decimal and hex) of the character under the cursor.

The next option on the Misc menu is Filetype. You can slide off this choice and alter it as required.

The next choice, <ctrl-shift-f9> will present on screen StrongED's character picker. This was described in part one of the series.

The last item on this particular menu will inform you whether the file you are currently working on is write protected or not. If owner and public read attributes have been locked previously, you will not be able to edit the file at all.

The save menu

Dragging the mouse to the right from this choice will display StrongED's save box. If a block of text has been marked, the Selection option will no longer be greyed out, and this can be set in order to save just the marked text. The default filename for marked text is 'block'.

The block menu

The first item on this menu displays keyboard methods of marking text within a document. The first choice, offered by key <f6> is to mark the start and end of a block. Simply place the cursor at the start of the required area and press key <f6>. Move the cursor to the end of the required area and press this key once more. The marked blocked can then be dragged to another area of the document or can be dragged out of StrongED into a filer window or indeed another application window.

This menu option also displays ways to mark certain areas of text. To mark a word under the cursor press <ctrl-A>. To mark the line containing the cursor press <ctrl-AA>. Finally, to mark the entire text press <ctrl-AAA>.

The second item on this menu displays a key shortcut to clear marks. This is achieved by the key combination <ctrl-Z>, or alternatively using the <escape> key.

The Process option from the Block menu offers eleven choices. The first six of these have keyboard shortcuts assigned to them. They are: Copy: <ctrl-C>, Move: <ctrl-V>, Delete: <ctrl-X>, Upper case: <ctrl-U>, Lower case: <ctrl-J> and finally Swap case: <ctrl-s>.

The next option, Indent, permits a positive value to be entered into a writable icon in order to indent the block by that many spaces. A negative value entered into this writable icon and applied to the same block will remove the indent set previously.

Tabs to spaces will replace all tabs in a block with spaces. The next command will reverse this process.

The choice ROT13 will encrypt your StrongED block by adding 13 to the ASCII value of each character. You could then send this encrypted file to another StrongED user. He could then use the same command to decode your text.

The final choice on the Block.Process menu is the Sort option. This will sort the lines of a block into ascending order. You must include a LF or CR under the last line of the block for the sort operation to take place.

The final option on the Block menu relates to the Clipboard. The commands offered by this choice are: Copy to clipboard: <ctrl-shift-C>, Cut to clipboard: <ctrl-shift-X>, Paste to text: <ctrl-shift-V> and Purge clipboard: <ctrl-shift-Z>. As mentioned in part 1 of this series, StrongED's clipboard is fully compatible with that offered by the Impression family of DTP applications.

Part 1 of this series seems to have generated a renewed interest in this excellent text processing

application, judging by the correspondence that I have received to date. In the next part of the series, I will explain the remainder of StrongED's menu commands.

Please send me your feedback, questions, suggestions, etc by email or post, via the NCS office, and Paul will pass it on. Thanks. ◆

More Emulators!

Dave Floyd

There's not much of a selection of games for the Acorn machines – well, not compared to certain other platforms. The PC card allows games players to get around this to a certain degree, as do the 6502 and Z80 emulators from Warm Silence Software which were reviewed in recent issues of Archive (10.4 p35 and 10.5 p76 respectively). There are other options though.

Nintendo Gameboy

You know the machine! It's ideal for passing the time on long train journeys – and annoying your fellow passengers! It has greyscale graphics – a cunning decision by Nintendo, as colour uses far more battery power – and is available in all manner of case colours, including clear and metallic.

Not so portable, but cheaper, is the Gameboy emulator written by Purple Monchichi and provided with a RISC OS front end by Paul Clifford. Now at version 0.06, the emulator operates in a window and allows the saving of games, entry of cheat codes and it lets you resize the window to your own requirements, a fairly essential requirement if you use a high resolution mode as standard. The emulator seems to work very well on a StrongARM machine, though as the !Help file says, it may run a little slowly on other processors.

It coexists with the rest of the desktop happily, and automatically pauses if you give another window the input focus. This makes sense as it saves having to find the pause key or dig through a menu structure to stop the game while you get on with something else. Mind you, games can also be paused by using <escape> or any other key you choose. All the control keys are configurable by the user, and I had no problem setting up the TBA JoyPad to add a touch more authenticity to the play.

Everything I tried with the Gameboy emulator worked fine, even the games I'd had no success with on previous versions, and the sound can be turned off if you prefer to play in silence. The screen is far clearer than on the real Gameboy, and while it may seem like a retrograde step to be playing monochrome games in a small window on a RiscPC, the best of the games available for this platform easily make up in gameplay what they lack in graphical capability, without the graphics becoming as basic as those found on most Spectrum games, for instance.

Sega Master System and GameGear

The predecessor of the Megadrive is now also emulated on the Acorn platform courtesy of Gareth Moore, who has ported over the PC version originally written by Marat Fayzullin. This emulator is very much in its infancy and is numbered version 0.80 beta, but for all that, it performs the job it sets out to do. Many improvements are planned, and it will be interesting to follow its development.

It currently takes over the whole machine, requiring <escape> to return to the desktop, but it does that cleanly so it is not that critical. The area around the playing area is a little messy too, but this is a beta release and I didn't notice it once Sonic the Hedgehog was spinning through the air.

The emulator also doubles as a GameGear, Sega's competitor for the portable console market. While this machine was technically better than Nintendo's Gameboy, it was more expensive and required more frequent battery changes due to its colour screen, so it was never as popular. I haven't tried any GameGear images with it, but assuming they run as well as the Master System games I have tried, this could be very useful.

Once again, everything I have tried with the emulator seems to work, but there are some games listed in the documentation that apparently won't, for one reason or another. Compatibility can only get better with each release and, as I said at the start, this is a beta release. As such, it is very impressive.

There is a down side though, before all you A3000 owners out there race for your modems and hit the download button. At present, it is only realistically usable on a StrongARM machine (on which it runs slightly fast) and the documentation states that, on a RiscPC with an ARM 710, the emulator runs some two and a half times too slowly. Whether it will be possible to expand the range of machines that the Sega emulator runs on, I don't know, but for the facility of playing Sonic the Hedgehog, and all those other games that will never be released for the Acorn market (nor matched in gameplay by 99% of native games software, unfortunately), the StrongARM upgrade must be looking very tempting to any RiscPC-owning game players who have not yet upgraded. *(Still a few left at £249! Ed.)*

Important

By running this short article, I am simply passing on information that may be of interest to the readership. Neither I, nor NCS, condone software piracy, and it is important to note that owning disc images of any games for the above emulators for which you do not own the original cartridges, is illegal. In some countries, it may even be illegal if you *do* own the original games.

The Gameboy emulator can be downloaded from Arcade BBS, and the Sega emulator from http://www.doggysoft.co.uk/gaming, and both are on the Archive monthly disc and the Paston website. ◆

Gerald's Column

Gerald Fitton

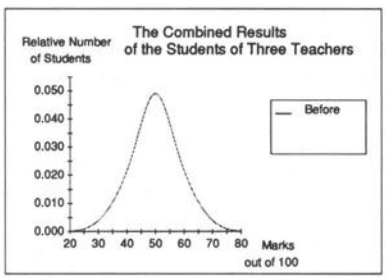
There are a few bad teachers but nothing like as many as you might believe, so I'd like to tell you a story about some teachers. The question I'd like you to ask yourself is, which is the bad teacher and which is the good teacher?

It all happened over ten years ago, and so most of the main players are beyond the reach of the nouveau managers who are destroying our profession. In telling the story, I want to introduce you to the normal distribution function and its implementation in those spreadsheets which don't include it as a standard function.

My story also needs illustrating with graphs. For this article, I have chosen to use Fireworkz to generate the graphs, but I have added text to them using DrawPlus (an excellent extension of Draw by Jonathan Marten) before porting them into Impression for publication.

The problem

It must have been about ten years ago that the Head of Department called all seven of us A Level Maths Lecturers into his office and told us the bad news! It would seem that our joint performance had been measured by an outside body and, as a team, we were not up to standard! The number of passes in Maths at Grade C was below average for the County, as was the number of Grade A passes. Bill, our boss, was a caring Head of Department. He didn't give us the same rocket as he had undoubtedly received himself. He wanted to know what was going on, and wanted suggestions for improving our performance.



We had the Maths A level results and we had the results of a mock examination which we ran a few months before the real examination. The students of all seven lecturers sat the same mock exam; the marking had only a very minor subjective element. The correlation between the mock results and the real examination were good, so we decided to use the mock results, rather than the real results, for the investigation. One advantage of using the mock results was that we had marks (out of 100) rather than grades and hence a finer gradation of scores. A second advantage was that we would be able to find out which topics resulted in low marks and which in high marks.

The graph opposite is not a completely accurate representation of the situation as it was ten years ago. I have simplified my representation of the situation by making the mean mark 50%, and I have arranged for 95% of the students to have marks between 32% and 68% (a standard deviation of about 9%). In fact, the mean was a little higher, the results were spread more widely, and the distribution slightly skewed.

The target (using my adjusted model) was to raise the mean to 55% and for 95% of the students to receive marks between 40% and 70% (a standard deviation of about 7.5%).

Gerald

I have made one more further simplification so that you can follow what is going on; I have followed the fortunes of only three of the seven lecturers. Of these three, one is fairly typical and the other two represent the extremes of performance.

The first performance criterion to come under scrutiny was the percentage of students who got a Grade A. In the model I'm using for this explanation, 68% would correspond to a Grade A. It soon became apparent that, of all seven lecturers, Gerald's students got the fewest Grade A's. Indeed, it was rare for any of Gerald's students to get more than 65% as the graph below shows.

A meeting was called to discuss the Grade A study, and Gerald was duly summoned to account for his poor Grade A performance. It was Brenda, (who got the most Grade A students) who pointed out that Gerald also had the fewest (indeed hardly any) failures.

The graph shown below left was produced using a Fireworkz spreadsheet. It is the graph of a normal distribution with a mean of 50 marks and standard deviation of 5 marks.

The normal distribution

As far as I am aware, the Normal Distribution was first discovered by Carl Fredrich Gauss (1777 – 1855). In my view, he is the greatest mathematician ever to have lived. I would rank Archimedes second and Newton third. It was his mathematics which allowed Albert Einstein to do his Relativistic sums. The unit for magnetic field is named after him. When I was at College, the Normal Distribution was called the Gaussian Distribution of Errors and its integral, the cumulative distribution function was called Erf(x) (ERror Function).

Most spreadsheets include the normal distribution function, the cumulative normal distribution function and its inverse, as standard functions. PipeDream and Fireworkz do not, so if you want them, you have to write them yourself.

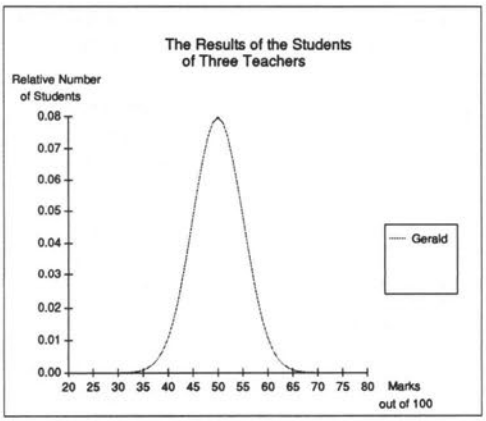
The formula for the normal distribution function is:

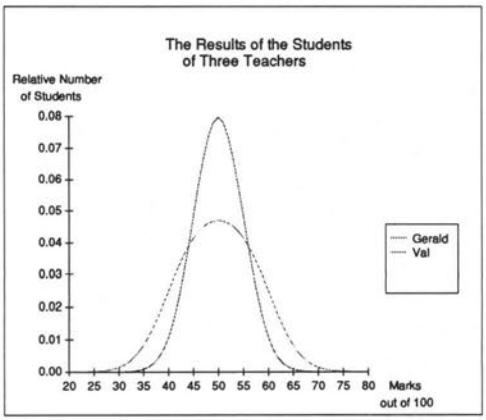
y = exp(–(x – mean)/sd)^2/2)/(sqr(2*pi)*sd)

Substitute the mean = 50 and sd = 5 in the above formula, and draw an X – Y graph from x = 20 to x = 80. You will repeat the graph which is shown above. It is a fair representation of Gerald's results.

Val

The next lecturer to come under scrutiny was Val. Now Val was what I would call a good competent standard lecturer. Her results were fairly typical of



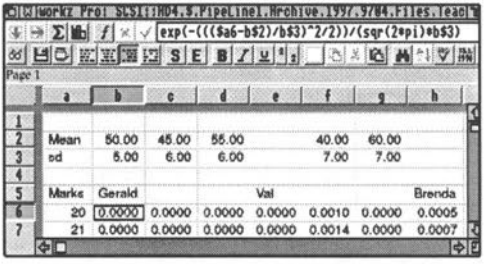


five of the seven lecturers, and her students' marks ranged from about 30% to 70%, whereas Gerald's ranged from about 35% to 65%. Gerald does better with the 'weak' students than Val. Val does better with the 'good' students.

We tried to fit a normal distribution function to Val's results but it didn't work out at all.

A remark by Val put us on the right track. She said, "I get on a lot better with some of my students than others."

We tried adding together two normal distribution functions and got a good fit. If you want to have a go at the graph shown above, you can reproduce Val's results by adding together a normal distribution having a mean of 45 and another with a mean of 55. The standard deviation of both is 6.



The screenshot above shows part of the developing spreadsheet. In column b, I have calculated the normal distribution values for Gerald's mean and standard deviation. In columns c and d, you'll find the two components of Val's distribution. Column e contains the average value of columns c and d.

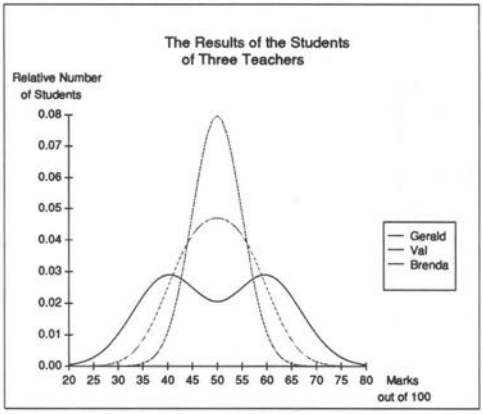
Brenda

Now we come to Brenda. Brenda's weaker students used to say of her that she "Took no prisoners". Brenda was the most brilliant mathematician in our department. If I ever had a mathematical problem I couldn't solve, I would take it to Brenda and she would come up with the answer so quickly that I wondered if I was going senile!

Our best students got on very well with Brenda but, if you couldn't keep up with her, you were lost! Just like Val's (but more so), we found that we couldn't fit a normal distribution to her students' results, but we did find that it was the sum of two normal distributions.

I have to admit that, in my simplified representation of the problem here, I don't do justice to Brenda. The mathematical model depicted here implies that she 'lost' half her students. It was less than half.

Have a look at the distribution below, and you'll see that Brenda's distribution is bi-modal.



Brenda achieved the highest percentage of Grade A students by far – but also the highest failure rate. The antithesis of Gerald.

I have used columns f and g of the spreadsheet for the two components (means 40 and 60, with standard deviation 7) and h for the average of the two.

The solution

Take yourself back in time to the mid 1980s. The conventional wisdom from on high at that time was that all students had to be treated equally, indeed they might all be equal. Streaming was a taboo word. It is to the great credit of Bill, our boss, that he agreed to stream the students and pretend that we weren't doing so.

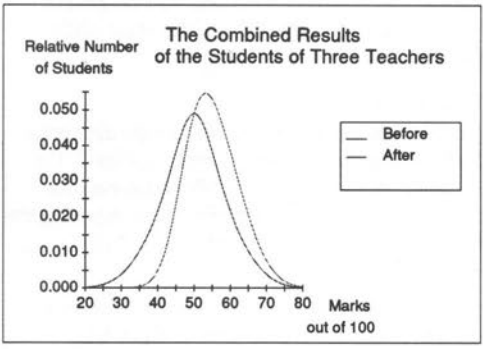
We streamed the students for Maths after the first term, and then Bill fiddled the registers so that all lecturers got their fair share of the credit for Grade As, etc.

You will guess that I (Gerald) got the students who might otherwise fail and Brenda got the whizz kids (who enjoyed her teaching much more).

So what was the end result?

Referring to the columns of my spreadsheet, I have used column i for 'Before'. I have added Gerald

(column b), Val (column e) and Brenda (column h) and divided by 3. For the 'After' in column j, I have added columns b, d and g. In fact, the results were slightly better than the graph of column j shows – particularly at the top end.



For the simplified mathematical model I've used here, the mean has increased to about 55% and the standard deviation has been reduced to about 7.5%.

Streaming or setting

It would seem that the pendulum of popular wisdom is swinging back to a form of streaming called 'setting'. The difference between the two is that streaming labels a 'weak' student as weak in everything and they sit in the 'weak' stream classes for every subject. Setting groups the students for each activity, so that you might find a different group in Gerald's class for Maths than you would for Computing.

Bill, Val, Brenda and Gerald

So what happened to the main characters in the scenario above?

There was a reorganisation, and the department headed by Bill was broken up. **Bill** was told he didn't have a job under the new regime and was forced into early retirement. He suffered a heart attack shortly after retiring but recovered well after a heart by-pass operation. **Brenda** couldn't stand the extra paperwork which Bill used to handle so well. So she took early retirement and died suddenly a year later. **Val** moved to Torquay to get married – but couldn't get a full time job in teaching Maths for about five years. **Gerald** (me) was transferred to the Business Studies Department, and took to writing a monthly PipeLine column for Archive! *(For which I am **very** grateful! Ed.)*

Finally

Please send a disc, self addressed label and return postage if you want a problem solved. My address is that of Abacus Training (see back inside cover). Many thanks for all your letters. ◆

Music Column

Alan Gibson

Happy New Year! Yes, it's been that long since my last column, and I must apologise for the lack of a Music Column. The Christmas rush is only starting to die down, and I have several shows taking up my spare time, all of which makes me forget Paul's deadlines. Anyway, there has been a fair bit of news, and some new products launched, since my last column, so I'll detail the main ones here. Incidentally, I never intend to review products as this is best left to independent reviewers. Instead, I prefer to give a 'user's opinion' on products, to give a different perspective on things. The new products listed here will no doubt be reviewed fully in due course.

Sibelius have now moved into the American market with their own office over there, allowing them to tap into the vast Hollywood film market. To aid in this, Sibelius 7 now has SMPTE compatibility, for example allowing bar numbers to be displayed as minutes and seconds instead of the standard numbers. They also now have new email addresses and will be moving their website soon – for more details, you can now email info@sibelius-software.com instead of the old demon address. More Sibelius 7 demonstrations have been lined up in the UK over the coming year (as long as you're not in Wales or Ireland that is).

Parallel port interfaces

Parallel port MIDI interfaces are now available from both ESP and Q-Tec Technological Resources (and dealers of course), although only in single-port flavours at the moment. All types plug into the printer

interface at the back of your computer, which allows portability as well as being the only expansion option left for many users of the smaller machines which have already been expanded. If you need to print as well, you can share the printer by using a standard switch box.

The ESP interface looks like a silver Impression dongle with three short cables sticking out, giving the standard IN, OUT and THRU connections. This is a very neat solution, although if you only have short MIDI cables, you may be a bit tight for room. The supplied !PPMIDI software contains all the low level drivers needed to use the interface with *any* Acorn machine, including those such as the A3000 which only have single-direction parallel ports. The software also allows you to filter out certain specific MIDI messages from the data, and to alter the MIDI clock code. There is even a Port Monitor window to show MIDI activity.

The Q-Tec solution is slightly different. As they are doing a range of interfaces (including a 2 IN, 4 OUT and a 4 IN, 4 OUT & SMPTE one), the design is not as straightforward as the ESP ones. Instead of a plastic dongle, these ones are in screen-printed metal boxes with a cable going from the box to the printer port (as with a data switch). The box then has all the necessary IN and OUT sockets around the edges (note that there is no THRU connector on any of the Q-Tec ones). There is a power supply socket as well, for the larger interfaces. (Both the Q-Tec 1×1 and the ESP 1×1×1 interfaces work without external power supplies.) The !MIDIPlus software is more basic than the ESP software, being just a low-level driver and, instead of having a software monitor, the Q-Tec boxes have LEDs on them to indicate data transfer. By the time this goes to press, the 2 IN, 4 OUT interface might be available, in which case I'll give it a run over in my next column.

So, which one do you choose? They are both the same price (around £90) and both are available now. If you have an older machine with a single-direction parallel port or if you require a THRU port, the ESP one is the only choice. The Q-Tec one is more robust and, thanks to the extra data cable, you can bring the interface nearer to your keyboard if the back of your computer is inaccessible. Both work perfectly well with everything I have tried with them, so it all comes down to your personal preference, I'm afraid!

On another Q-Tec note, their !Karelia software is now available as Version 1 and is supplied with the excellent Yamaha MU-10 sound modules. Anyone who is familiar with the !Conductor software supplied with the PowerWAVE cards will be at home with Karelia. Q-Tec intend to develop Version 2 into a full XG editor as well as being an excellent MIDI file player.

Sequencers

Since my last column, I have become the distributor for MelIDI so, in an effort to remain unbiased, I'm not going to plug any one specific sequencer over another! The current information I have regarding the various sequencers is as follows (in alphabetical order, of course!):

MelIDI – now available in beta release form for a reduced price from Liquid Silicon. When fully released, it will available from all dealers as usual. A free demo is available, and the MelIDI web site is at http://www.shef.ac.uk/~av1dpm/melidi/

MIDIWorks – currently in beta release but not available as I write. Neither is there a demo yet. However, there is further information on the Oregan web site at http://www.oregan.demon.co.uk

MusicStudio 32 – Longman Logotron's long awaited package is now apparently available, although I have yet to see it. I would imagine a demo would be available if there is a full release version.

(It must be the year for 'M' names... !)

Oregan have also recently produced StudioSound which is, very broadly speaking, a sequencer for sound samples. Using it with their excellent ProSound package, you can record your own sound samples, and mix and edit them in a similar way to using a sequencer with MIDI data.

Coda

A few people have asked why I write 'Midi' instead of 'MIDI'. Er, I don't – ask Paul about that one!

(OK, then, I'll leave it as 'MIDI'! I just feel that large blocks of capitals in a body of text look ugly – that's why, some years ago, I changed to using 'Basic', 'Unix', etc. Ed.) ◆

Alan Gibson <liquid@cableinet.co.uk>

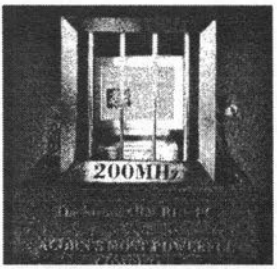
The StrongARM Clock

Paul Beverley

NCS has a new clock gracing its main office. It is basically a square clock consisting of the picture that has appeared in various places – the StrongARM inside a cage – remember it?

So, what can I say about this latest product? Well, it runs at 1Hz (not 200MHz as shown in the picture), and it keeps good time. It is 8½" × 8½" and has a hook on the back so that you can hang it on the wall.

The StrongARM clock costs £7.50 + £2.50 p&p in the UK, and is available from a Young Enterprise



company called Dinamyx, to whom cheques should be made payable. ◆

Starting Basic – Part 20

Ray Favre

'Free standing' PROC/FNs and Libraries

(My series on Wimp programming, using 'Dr Wimp', started in the last issue. You will find that the final two articles in the 'Starting Basic' series – this one and the next – are essential reading if you have not tried Wimp programming before.)

Before looking at libraries, it is best to revisit procedures and functions, together with the keyword LOCAL.

Keyword LOCAL

The introduction of this keyword (not to be confused with LOCAL DATA or LOCAL ERROR) has been left until now because its importance can easily be overlooked if it is included in the general introduction of PROC/FNs.

LOCAL is used with both DEF PROCs and DEF FNs in order to keep the value of a variable 'local' to that particular PROC/FN. A local variable means that any value assigned to it within the DEF PROC/FN, when the latter is in active use, will be confined to that PROC/FN *without affecting the value assigned to a variable of the same name somewhere else in the program*. This means that you can use the same variable name inside a DEF PROC/FN and somewhere else in the program as two independent variables.

A few examples will help to explain things better. Look at the following DEF PROC from our Loan program:

```
DEF PROCcentrePrint(String$)
ScreenWidth% = 80
Tab% = (ScreenWidth%-LEN(String$)) DIV 2
PRINT TAB(Tab%) String$
ENDPROC
```

The first thing to take on board is that the formal parameters of any PROC/FN are automatically made 'local' to their PROC/FN. Thus, String$ is automatically made local to the above PROC, and the same variable name could be used 'outside' the PROC somewhere.

What happens is that the Basic processor stores temporarily the 'outside' value of String$ (assuming there is one) as soon as the above PROC is entered. The normal variable storage space is then used for the local String$ values inside the PROC – and the 'outside' value is restored to its normal place when the PROC is exited. The non-local ('outside') variable is called a global variable.

The keyword LOCAL simply gives you the option of doing exactly the same thing with other variables used in the PROC. So, in the above DEF PROC, the two variables ScreenWidth% and Tab% are also used – and are clearly only used in a local context here. To make them 'local' to this PROC, the instruction:

```
LOCAL Tab%,ScreenWidth%
```

is simply added at the very start of the DEF PROC, i.e. immediately after the DEF PROC line. The order of the variables listed in a LOCAL statement is not important – and they are just separated by commas.

With this addition, the PROC can be called freely, without worrying if we've used the same variable names somewhere else in the program.

You may feel this is not a very big deal, but read on!

Free-standing PROC/FNs

Suppose we were using, as well we might, the above DEF PROCcentrePrint(String$) in a program using several screen formatting DEF/FNs, each with a need to know the value of ScreenWidth%. In that case, we would have probably have put:

```
ScreenWidth% = 80
```

in, say, PROCinit rather than where it is above – so that we could use that value in any other place, i.e. we would want ScreenWidth% to be a global variable rather than a 'local' one. We might still want Tab% to be local. So the new routine would be:

```
DEF PROCcentrePrint(String$)
LOCAL Tab%
Tab% = (ScreenWidth%-LEN(String$)) DIV 2
PRINT TAB(Tab%) String$
ENDPROC
```

with ScreenWidth% = 80 placed in, say, PROCinit.

However, we can have the best of both worlds by *also* making ScreenWidth% the second formal parameter of the above DEF PROC – with no further changes. Thus:

```
DEF PROCcentrePrint(String$,ScreenWid-
                                    th%)
LOCAL Tab%
Tab% = (ScreenWidth%-LEN(String$)) DIV 2
PRINT TAB(Tab%) String$
ENDPROC
```

We then use PROCcentrePrint(AnyString$, ScreenWidth%) to call the PROC, and the value of the global variable ScreenWidth% – declared in, say, PROCinit – will be passed to the (automatically) local variable ScreenWidth% for use inside the PROC, i.e. one name, two variables, as explained above.

The main advantage of doing this is that DEF PROC centrePrint(String$,ScreenWidth%) *can now be used in any program, without alteration.* It is 'free-standing' – totally without any global variable inside it, and yet you can still use global variables (of the same or different names) or direct values at will in the passed parameters when you call it.

Having a PROC/FN which is already available, and is known to work, is a tremendous advantage in program development. It reduces errors, and debugging is made easier – and much time is saved.

Hence, the practice of making PROC/FNs free of global variables is to be strongly recommended – by the use of formal parameters and the keyword LOCAL in combination.

There is a (very) small price to pay: the direct result of the above recommended practice is that the number of formal parameters per DEF PROC/FN inevitably increases – exactly as demonstrated above with ScreenWidth% – but this is not usually a practical problem.

Although I having recommended the practice, you will detect that our Loan program does not always follow it! The reason is that, in this Beginners' series, it was more important to avoid adding more than one new topic at a time – and the concept of local variables was considered important enough to leave until now.

Libraries

From the foregoing, you will not be surprised to hear that most programmers tend to build up collections of useful PROC/FNs which can be used in many different programs, and BBC Basic caters for this, providing some very useful facilities which are very important in Wimp programming, and which can be used equally effectively in the non-Wimp environment.

Whilst it would be entirely feasible to copy such PROC/FNs from program to program as needed, it is often much more convenient to use a 'library'.

A library is simply a collection of DEF PROC/FNs, which are held in normal Basic program form, and saved as a normal Basic file. This file is then identified to/by the program that wishes to use any of the PROC/FNs in the library, and thereafter these PROC/FNs can be called by the program in the usual manner. It really is as simple as that, although there are three different ways in which libraries can be

implemented, the corresponding keywords being LIBRARY, INSTALL and OVERLAY.

Keyword LIBRARY

This is the easiest method to use – and the most common. LIBRARY is a normal Basic statement (i.e. normally used within a program) which takes the form: LIBRARY FileSpec$

where FileSpec$ is a string which needs to evaluate to a valid file specification (for the filing system in use) of the library file you wish to use. Thus, you can locate your library file anywhere you like, and just put its complete file specification – as a string (in double quotes if you are using a direct string) – in place of FileSpec$ in the above Basic statement, usually somewhere near the start of your program.

When run, the program finds the library file, and loads it into RAM just above the program which called it. For all practical purposes, the effect is that *all* the PROC/FNs in this library are now part of your program, just as if you had added them to the program listing yourself – and the size of the program increases correspondingly. You can now call any of the library PROC/FNs at will during the program – and they will disappear like ordinary variables when a new program is loaded/run.

You can use LIBRARY to load as many library files as you wish, within the limits of the RAM available for Basic operations. When a PROC/FN is called, the most recently loaded library file will be searched first (but after the normal program DEF PROC/FNs, if any). This is not usually a significant issue but it's nice to know.

Because it allocates memory space and produces 'fatal' errors if the library file cannot be found, it is best to use LIBRARY very early in the program, and it is usual to see it (or them) as the first real statement, i.e. after any introductory REMs.

Keyword INSTALL

This keyword is a command *which cannot be used within a program*. Therefore, *before* loading a Basic program file which is going to use the library, you must type in: INSTALL FileSpec$

from the command line or Task Window, or it could be contained in a command script file such as an 'Obey' file – see User Guide.

With this method, the library(ies) are loaded right at the top of the RAM available to Basic programs – which is then reduced correspondingly. Thus, the loaded library(ies) do not become an integral part of the Basic program subsequently loaded, and will not be lost until you quit the Basic environment. This means that any Basic programs loaded/run later in the session can use the previously INSTALLed library(ies) without further ado.

You can, of course, use both INSTALL and LIBRARY. On calling a PROC/FN, the LIBRARY libraries are searched first, and then the INSTALL libraries (again, starting with the most recent).

Keyword OVERLAY

This final method uses less memory space but is more difficult to manage in practice. It is included here to complete the set, so to speak, and because the description only needs to be short – but it is unlikely that beginners will need it.

Its syntax is different from the above methods, and the general form is:

OVERLAY Lib1$,Lib2$,etc.

where each of Lib1$ etc, is a valid file specification string of a library file. When it is used (as a normal Basic programming statement), the processor firstly checks which is the longest file in the given list, and reserves enough space in RAM for this.

When a PROC/FN is called, which does not have a DEF in the normal program listing, the processor will first search any libraries loaded by LIBRARY and INSTALL and, assuming it does not found a match, it will then load each of the given OVERLAY libraries in turn into the same reserved space until it finds the matching DEF. (Each loading overwrites the previous OVERLAY loading.) The library containing the match then stays loaded until another PROC/FN is called. If it cannot be found, the other OVERLAY files are loaded in turn as before.

Once a match is found, the processor 'remembers' the library in which it was located and loads that library straightaway if the same PROC/FN is called again, and the correct library is not still loaded.

The advantages and disadvantages of OVERLAY are probably clear to see. The memory space needed is much reduced – but a good deal of thinking, and library file organisation, is needed to avoid problems.

For instance, you cannot call a PROC/FN in one OVERLAY library from a PROC/FN in another OVERLAY library. However, you can get rid of libraries from the overlay list if you know it (or they) will not be needed later in the program, by just re-issuing the OVERLAY statement with null strings to replace those library files no longer needed.

You do occasionally see utilities which help organise OVERLAY libraries – and, by coincidence, the December 1996 issue of 'Risc User' has one.

Building PROC/FN libraries

There are a few points to watch when building your own set(s) of libraries.

• All DEF PROC/FNs in libraries really need to be 'free standing', as described earlier.

• Program statements in libraries must not use any line number references, so if DATA lines are included within library listings, the RESTORE+ form needs to be used to access the DATA items safely.

• The line numbers (if you use them at all) in your library listings are not too important. You can start from 10 in each library if you like and it will not cause conflicts with your program numbering or with other libraries.

• Each library should best include one DEF PROC specially-produced to print out information about each of the DEF PROC/FNs contained therein. This needs only to be a series of PRINT statements which put the details on screen when this special PROC is called, from Basic Immediate mode, for instance.

• Each library should use its first line as a REM containing a descriptive heading (including a Version number) for the library, plus the name of the above special PROC so that you know what to call to see more information. This is more than good housekeeping, as there is a BBC Basic command LVAR which can be used to list all defined variables, the names of any PROC/FNs which have been called, plus the first line of any loaded libraries (in the order they will be searched). LVAR is fairly easy to use in the non-Wimp environment. First enter Basic from a Task Window, load and run the program of interest, and then type LVAR to get the list.

```
REM> PrintLib : Version 1.2 ***
REM Text and number formatting routines (for both Wimp and non-Wimp programs).
REM Call "PROCprintLibHelp" for details of each PROC/FN ***
REM*****************************************
DEF PROCprintLibHelp
REM*** Prints out details of all PROC/FNs in library. **
PRINT "PROCcentrePrint(String$)"
PRINT "Places a string centrally on a 80-character screenwidth line"
PRINT
PRINT "FNnumberToString(Number,DecPlaces%)"
PRINT "Converts any real number to string form, correctly rounded to chosen
number of decimal places. Adds leading or trailing zeros as necessary."
PRINT
 etc.
 etc.
ENDPROC
REM*****************************************
DEF PROCcentrePrint(String$)
 (definition lines)
ENDPROC
REM*****************************************
DEF FNnumberToString(Number,DecPlaces%)
 (definition lines)
=NumberString$
REM*****************************************
 etc.
```

• Be careful to keep separate Wimp and non-Wimp libraries. Several SYS calls (see next time), for instance, are meaningless or will not work in the non-Wimp environment. Conversely, as we have stressed, several Basic keywords ought not to be used in Wimp programs. It is always a good idea to check out any proposed library PROC/FN in both environments first, if you are not sure.

Typical library format

The dummy listing on the previous page shows the form of a typical library with the above features. DEF PROCprintLibHelp is an example of the special PROC referred to above.

Next time ...

... we will introduce SYS calls – and that will be the final article in this series. As always, feedback, questions, queries, etc are welcomed. Please write to me at: 26 West Drayton Park Avenue, West Drayton, UB7 7QA. ◆

Basic to Drawfiles – Part 4

Peter Borcherds

In this article, I will be describing _Draw_Lib, a library of routines designed to help produce drawfiles from Basic programs.

For examples of how to use the library, see the programs Bézierfit and Demo_Draw. The library duplicates many of the BBC Basic standard graphics keywords, such as DRAW, ELLIPSE etc, and also includes explicit routines for some of the graphics commands not explicitly available in Basic, such as 'arc' and 'sector'.

In _Draw_Lib, the names of procedures and variables, other than those LOCAL within a procedure, start with '_'. Names of procedures and variables which may be used externally start with '_draw_'.

In the library, the procedures are grouped as follows:

1) Housekeeping routines: to set up the header block of a drawfile, to define fonts, to save the file

2) Primitive procedures, which are called by other procedures, to build the drawfile, to update bounding boxes, etc

3) Procedures for including text in a drawfile

4) Procedures for creating 'paths', consisting of subpaths, which are lines and curves. (See the previous article for a description of paths.) It is convenient to divide these path procedures into subgroups:

(a) housekeeping procedures, for setting up the details of a path, such as the line thickness and colour
(b) procedures for drawing a sub path, such as drawing a line, or a circle, and (c) procedures for drawing a complete path, including the housekeeping information: see subgroup (a)

Many of the procedures in subgroup (c) duplicate ones in subgroup (b). To distinguish them, we have used the following naming convention. All those in subgroup (b), defining sub paths, have names entirely in lower case, such as PROC_draw_ellipse, while those in subgroup (c), defining complete paths, have names such as PROC_draw_Ellipse, with the first letter of the descriptive part of the name in uppercase.

Limitations of _Draw_Lib routines

The library procedures sets up object bounding boxes which may not be quite right for either of two reasons. (i) The size of a path bounding box ought to allow for a finite line thickness and for the size of triangular line caps. _Draw_Lib does not allow for either of these. (ii) The library procedures assume the bounding box of a path is determined by the coordinates of its control points. The bounding box of a Bézier curve may be smaller than the box defined by the control points, e.g the inner control points of a circular quadrant lie outside the bounding box.

Experience suggests that such imperfections in setting up the bounding boxes do not affect the appearance of the objects in a drawfile. If Draw is used to examine or edit a drawfile, it is found that the bounding boxes take on their 'proper' values.

It is probably advisable to load any drawfile created from the procedures in _Draw_Lib into Draw and then save it before attempting to load the file into some other application such as a desk top publishing program.

Housekeeping routines

`PROC_draw_initialise(`*`appl$,nfonts%,size%`*`)`: This must always be the first routine to be called. It sets up the draw header file. *appl$* is the name of the program or application creating the file. *nfonts%* is the number of fonts to be used. *size%* is the maximum size of drawfile you may have (there is no disadvantage in making *size%* very big: when you save a drawfile, its size will be set to whatever size is necessary to contain what you have included in the drawfile.)

`PROC_draw_reset`

`PROC_draw_savefile(f$)`

`PROC_draw_fontobject`: This defines the fonts for the drawfile: the fonts must be in _draw_font$(), which is set up in PROC_draw_initialise.

`FN_colour(c%)` sets the colour flag for a path or text object.

Primitive procedures

These are called by other procedures, to build the drawfile, to update bounding boxes, etc.

`PROC_update_draw_box(box())`: This and the next routine keep track of the bounding boxes for the whole file, and for each object.

`PROC_update_object_box(box(),x,y)`

`PROC_putword(W%)`: This puts a word in the file, and increments the pointer to the file. W% is in internal units.

`PROC_putstring(S$)`

`PROC_put_point(X,Y)`: This puts a pair of words into the file. X and Y are in OS units.

`PROC_vector(X,a,Y,b,angle)`: Rotate vector (a,b) through angle, add it to vector (X,Y), and put the resulting two words into file (OS units)

`PROC_putcoords(start%,box())`

For including text in a drawfile

`PROC_draw_textobject(font%,text$,pt(), x_o,y_o,fg%,bg%)`: text object, `x_o,y_o` are coordinates where text starts, `fg%,bg%` are foreground and background colours

`PROC_draw_Textobject(font%,text$,pt(), x_o,y_o,fg%,bg%,thick%)`: text object with bounding box, line thickness thick%

`PROC_text_box(text$,font%,pt(),box())`: Calculate size of object box of a text string

`PROC_draw_string(q$,x,y)`

Other procedures

In this section, there are procedures for creating paths, consisting of subpaths, which are straight lines and curves. Then there are housekeeping procedures, for setting up the details of the path, such as the thickness of the line.

`PROC_draw_openpath(fill%,col%,thick%, dash%)`: Every path starts with this, which sets the characteristics of the line.

`PROC_draw_closepath`: Every path must finish with this.

`PROC_draw_close_subpath`
The next set of procedures are for drawing a subpath, such as drawing a line or a circle. Many are similar to Basic keywords.

`PROC_draw_move(x,y)`: each subpath starts with a move command.

`PROC_draw_draw(x,y)`: draw a line from current position to the point (x,y).

`PROC_draw_bezier(x1,y1,x2,y2,x3,y3)`: draw a Bézier curve from the current point, with explicit control points (see Archive 10.1, p44).

`PROC_draw_line(x1,y1,x2,y2)`: draw a line from the point (x1,y1) to the point (x2,y2).

`PROC_draw_rectangle(x1,y1,x2,y2)`
`PROC_draw_circle(x,y,r)`: draw a circle, with centre at (x,y), with radius r.

`PROC_draw_ellipse(x,y,a,b)`: draw an ellipse with principal axes along coordinate axes.

`PROC_draw_ellipse_rot(x,y,a,b,angl)`: ellipse with principal axes rotated through angl.

`PROC_draw_arc(x,y,r,angle0,angle1)`: draw a circular arc, from angle0 to angle1.

`PROC_draw_segment(x,y,r,angle0,angle1)`: draw a circular segment, from angle0 to angle1.

`PROC_draw_sector(x,y,r,angle0,angle1)`: draw a circular sector, from angle0 to angle1.

`PROC_draw_dot(x,y,r)`: draw a filled circle, with centre at (x,y), with radius r.

`PROC_draw_cross(x,y,dx,dy)`: plot a cross at (x,y), with arm lengths dx, dy.

Finally, there are procedures for drawing a complete path, which implicitly contain the housekeeping information.

```
PROC_draw_Line(x1,y1,x2,y2,thick%,
dash%)

PROC_draw_Rectangle(x1,y1,x2,y2,
fill%,col%,thick%,dash%)
PROC_draw_Circle(x,y,r,fill%,col%,
thick%,dash%)
PROC_draw_Ellipse(x,y,xm,ym,fill%,
col%,thick%,dash%)
PROC_draw_Ellipse_rot(x,y,xm,ym,fill%,
col%,thick%,dash%,angle)
PROC_draw_Arc(x,y,r,fill%,col%,thick%,
dash%,angle0,angle1)
PROC_draw_Segment(x,y,r,fill%,col%,
thick%,dash%,angle0,angle1)
PROC_draw_Sector(x,y,r,fill%,col%,
thick%,dash%,angle0,angle1)
PROC_draw_Dot(x,y)
PROC_draw_Cross(x,y,dx,dy)
```

The procedures for drawing arcs, ellipses etc all call either `PROC_draw_arc` or `PROC_draw_ellipse_rot`. ◆

Assembly Language – Part 6

Chris Johnson

After I submitted the last article, I think that Paul gently hinted it might have been a wee bit on the long side, especially as there were several other articles devoted to other aspects of programming in the same issue. Therefore I have lowered my sights a little for this month, and will deal only with shifting and rotating.

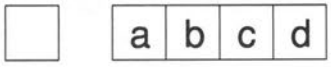
Shifting and rotating

We have alluded several times, in past articles, to the process of shifting bits around within a register. It is time we looked at this in more detail. The first thing to do is to differentiate between a shift and a rotate.

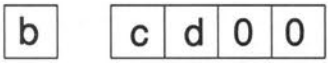
Shifts

In the case of a shift, we move the bits either to the left or the right, and the bits that 'fall out' are lost for ever, except for the last one, which is copied into the carry flag. At the other end, zero bits are moved in. Perhaps a small diagram would make it easier to appreciate. To keep things simple, we will use a 4-bit register and carry out a left shift by two bits. I will designate the original contents with letters a to d, although in reality the bits can only be 0 or 1.

Before the shift:



After a left shift by two bits:



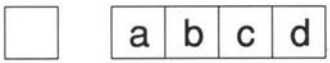
You can see that the original bit-a has been lost completely, bit-b is now in the carry, and two zero bits have been moved into the two low positions. With the ARM, all shifts and rotations, left or right, can be by any number of bits from 1 – 31. A zero or 32-bit shift has no effect. If higher numbers are used, the value is reduced modulo 32 to bring it within the range of the 32-bit register.

A shift of one bit to the left has the effect of multiplying the value by 2, and a shift of one bit to the right has the effect of doing a DIV 2. The >> and << operators may be familiar to Basic programmers.

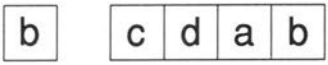
Rotations

Rotations differ from shifts in that bits that fall out at one end are fed back in the other end. For a left rotation by two bits, we would have the following situation.

Before the rotation:



After a left rotation by two bits:



Note that, not only are the bits which fall out fed back in at the other end, but the carry still retains a copy of the last bit to be rotated.

The ARM implementation

There aren't any instructions that specifically carry out shifts or rotations. In the ARM instruction set, which we have given in general terms as:

```
opcode, destination, lhs, rhs
```

the rhs part of the instruction can contain a shift/rotate suffix, where the number of bits to shift/rotate can be given as an immediate constant, or as the contents of a register, and the shift operates on the rhs operand. The actual contents of the rhs register are *not* changed by the shift/rotate, only the value which is actually passed to the barrel shifter. We will have a few examples in a while, but first the full list of possible operations.

LSL #n Logical shift left immediate

We essentially used this as the example of a shift above. After an n-bit shift to the left, n zeros have been shifted in on the right, n bits have been shifted out at the left, and the carry contains a copy of bit (32-n) of the original value.

If no shift is specified in the instruction, as will apply to the majority of instructions, then the assembler defaults to using LSL #0, which of course does nothing.

LSR #n Logical shift right immediate

This is the analogous instruction, except that the bits are shifted in the opposite direction. After an n-bit shift to the right, n zero bits have been shifted in at the left, n bits have been shifted out at the left, and the carry now contains a copy of bit (n-1) of the original value.

ASL #n Arithmetic shift left immediate

This instruction is identical in effect to LSL #n, and is present because of the symmetry of the instruction set.

ASR #n Arithmetic shift right immediate

This instruction is used when the value being shifted is to be treated as a signed integer. Remember that, in the representation of signed integers, bit 31, the top bit, is used as the 'negative' flag. In order for a right shift to correctly deal with a negative number, we cannot simply shift zeros in at the left hand end, since this would immediately make the value positive. This instruction shifts in bits that are the same as the original bit 31. Thus if the number started out as a positive number, then zeros are shifted in at the left as before (equivalent to LSR #n), but if it started out as a negative number, then 1's are shifted in at the left. This then makes the operation DIV 2 work correctly for a negative number.

ROR #n Rotate right immediate

A rotate right moves bits out of the right hand end and reinserts them in at the left hand end. A copy of the last bit to be shifted remains in the carry flag, as with the other instructions. The number of shifts allowed is in the range 1 – 31 bits. There is no necessity for a corresponding rotate left instruction, since a rotate left by n positions would be the same as a rotate right by (32-n) positions.

RRX Rotate right by one bit with extend

This is a special case of the rotate right. It shifts by one bit only. The old bit 0 moves into the carry flag, and the old content of the carry flag is moved into the bit 31. This is the only instruction in which the content of the carry flag is moved into the register.

There is no corresponding left rotate instruction RLX. However, the same operation can be carried out by making use of the instruction:

```
ADCS R0, R0, R0
```

Adding R0 to R0 will effectively multiply R0 by 2 (shift left by 1 bit), ADC adds in the content of the carry flag to bit 0, and the carry flag will be set if the addition overflows, i.e. if the original bit 31 was 1.

Specifying the shift by use of a register

The following instructions may all use the contents of a register to specify the number of bits to be shifted.

```
LSL Rx
LSR Rx
ASL Rx
ASR Rx
ROR Rx
```

Some examples of usage

If we simply need to shift a register's contents, a MOV instruction is required.

```
MOV R0,R0,LSL #4 ; R0=R0*16
```

Note we have to use the # symbol to denote an immediate constant. To specify a shift/rotate by the contents of a register, we could use an instruction of the form:

```
MOV R0,R0,LSL R2
```

On the earlier ARM chips, the multiply instruction, MUL, could take a large number of clock cycles, and hence could be slow. It is possible to use shifts to carry out fast multiply or divide, but only for a restricted range of multipliers. A simple left or right shift will carry out a multiplication or divide of 2^N, where N is the number of bits shifted. One must be careful to make sure that significant bits are not being lost, of course. For example, a multiply by 8 could be accomplished by:

```
MOV R0,R0,LSL #3
```

One could multiply by 9 or 7 by using:

```
ADD R1,R0,R0,LSL #3 ; R1=R0*8+R0=R0*9
RSB R1,R0,R0,LSL #3 ; R1=R0*8-R0=R0*7
```

In the latter case, we must use RSB which gives the result rhs – lhs. SUB would do lhs – rhs which would be R0 – R0*8. These instructions would execute faster than a simple MUL. It is possible to do more complicated multiplies in more than one instruction. For example, 640 is a number that would often be required as a multiplier (e.g. for calculating pixel addresses in 640×480 screen modes, and also in the interconversion of os units and millipoints). Now 640 = 512 + 128, and both the latter can be done with simple shifts.

```
MOV R1,R0,LSL #9 ; R1=R0*512
ADD R1,R1,R0,LSL #7 ; R1=R1+R0*128
```

Such sequences are possible because the use of the barrel shifter does not corrupt the value held in the register being shifted. Continuing the same theme, 480 = 512 – 32. Therefore, to multiply by 480, we would use the two instructions:

```
MOV R1,R0,LSL #9 ; R1=R0*512
SUB R1,R1,R0,LSL #5 ; R1=R1-R0*32
```

Similar constructs could be used to carry out divides, the only difference being that right shifts would be used to do the division.

Random numbers

There are lots of things we take for granted when using high level languages. One of these is a random number generator. So, to finish off, I will outline briefly one way of generating random numbers in assembler. The full program, and more description, is on the monthly disc.

This random number generator is based upon a *linear feedback shift register*, which consists of taking a seed binary number, EORing selected bits together to produce a 'random' bit, shifting the original number by one bit, and feeding the generated random bit back into the original number. A number of these random bits can be combined to produce a random number. The theory of random number generation has been discussed by many authors, e.g. in *Numerical Recipes for C/Pascal/Fortran*, or *Semi-numerical Algorithms* by the C guru, Knuth, and often in magazines such as Doctor Dobb's Journal. The method used here seems as good as any, in that no computer algorithm can be truly random. The core of the program makes use of lots of shifts, which is appropriate for this part of this series of articles. The linear feedback shift register is R0, and it is initially seeded (once) from the system clock, which counts in centiseconds from the last reset.

```
.makenumber
MOV R2,#6          ; Counter for number
                   ; of bits
MOV R3,#0          ; Register to
                   ; construct number
.getnextbit
MOV R3,R3,LSL#1    ; move current bits
                   ; to left ready
                   ; for next bit
MOV R4,R0,LSR#31   ; Top bit of LFSR to
                   ; bit 0 of R4
                   ; Now EOR with
                   ; various bits to get
                   ; the "random" bit
EOR R4,R4,R0,LSR#6
EOR R4,R4,R0,LSR#4
EOR R4,R4,R0,LSR#2
EOR R4,R4,R0,LSR#1
EOR R4,R4,R0
AND R4,R4,#1       ; discard all except
                   ; bit 0
MOV R0,R0,LSR#1    ; move LFSR to right
                   ; one bit
ORR R0,R0,R4,LSL#31
                   ; insert new bit 31
                   ; into LFSR
```

```
ORR R3,R3,R4      ; insert new bit as
                  ; bit 0 in number
SUBS R2,R2,#1     ; decrease bit
                  ; counter
BNE getnextbit    ; go round again if
                  ; more bits to get
                  ; we now have a
                  ; random 6 bit number
                  ; i.e. 0 - 64
```

The full program generates six numbers between 1 and 49 (for the lottery). However, it could be easily modified to pick eight draws, or whatever else takes your fancy. I also include on the disc a modified form of the program, which constructs, say, a million random numbers, keeping a count of how many times each number is chosen, so you can investigate how random is random – it takes only a second or so running in a task window with a StrongARM!

It was while playing around with these programs that I began to realise the ease of use and potential of task windows. It was extremely easy to run the program to generate, say, a million or so random numbers and print out the distribution, save the task window directly into edit, strip off the garbage at the top and bottom of the file, then pass the CSV file straight from Edit into my own Graphdraw, and produce a graphical display of the even distribution – a few seconds from start to finish. Now who wants to trade in for a Windows PC?

Next month

Next month we shall start to look at transferring data to and from memory.

My postal address is 7, Lovedale Grove, Balerno, Edinburgh, EH14 7DR; I can also be contacted by email at home as <chris@bulldog.u-net.com> ◆

Astra Satellite Television

Colin Sutton

This may seem an odd subject to appear in a dedicated computing magazine, but I have produced a set of eight A4 pages in TableMate (and in drawfile format) for Paul to put on the Archive monthly disc. The idea began some years ago, just after the first Astra satellite was launched, and I have been constantly updating the information ever since, as radio and television broadcasters have come and gone, or moved transponders (i.e. satellite transmitters) on the four analogue Astra satellites 1a, 1b, 1c and 1d covering all 64 transponders. (New experimental digital channels from transponder 65 upwards are not included.)

My aim was to enable me to find the broadcasters quickly, and in a logical manner. I never could get used to the BSkyB recommended channel order for so-called easy finding, and totally ignoring the (sometimes better) Dutch and German channels. Anyway, here they are in the same channel/transponder order as they are transmitted. I hope you will find it an interesting source of reference.

Teletext services

Most Astra satellite broadcasters also offer teletext services, and some devote several pages to computing

ASTRA (1a/1b/1c/1d) SATELLITE - 19.2 Deg. East
ANALOGUE TRANSPONDER ALLOCATION - January 1997

Trans. No.	Frequency (in GHz)	Pol.	Broadcaster (TV/Radio)	Language	Audio Subcarrier	Audio Preset	Skew	Teletext Language
1	11.21425	H	RTL-2	German	7.02 & 7.20	Stereo 1	-29	German
			Antenne Bayern	German	7.38 & 7.56	Stereo 2		
2	11.22700	V	RTL-Plus	German	7.02 & 7.20	Stereo 1	+36	German
			Deutsche Welle	German	7.38 & 7.56	Stereo 2		
			DW Europe 1	Various	7.74	Mono		
			DW Europe 2	Various	7.92	Mono		
3	11.24375	H	GRANADA Plus (day)	English	7.02 & 7.20	Stereo 1	-38	English
			GRANADA Men & Motors (eve)	English	7.02 & 7.20	Stereo 1		English

(mainly PC) and internet/WWW matters, with regular updates and references to interesting specialist web sites. A selection of these sources is set out at the end of this article. For Dutch and German broadcasters, the teletext pages will be in their native languages.

Satellite teletext on RISC OS

If the RF output, i.e. the aerial output connection, is cabled (using screened coaxial cable) into your computer teletext adaptor or interface board, and then tuned in to match the output frequency of the satellite receiver RF output, you can receive the broadcast teletext services without any problem. The satellite channels are changed on the satellite receiver

in the normal manner. There are other ways of connecting up, e.g. from your video RF output to the computer teletext interface. This assumes that the video is cabled *between* the satellite receiver and TV receiver and that a through RF connection exists, either in lieu of, or in addition to, the preferred SCART connections. If you are a cable subscriber, this latter method may be preferred.

What is there on Satellite?

On the computing theme, BSkyB have a dedicated Computer Channel broadcasting nightly between 1800 and 2000 hours on channel (transponder) 58 from Astra 1d. It is available as part of the Sky Multichannels subscription package and requires a Smart Card to be present.

To find more Satellite info

Transponder 6 Sat-1 – page 516
23 UK Gold – page 333
46 Paramount – page 745/746

To find Computing & Internet info

Key pages which lead on to others...

Transponder 6 Sat 1 – page 510
10 3-Sat – page 621
14 Pro 7 – page 190
19 ARD – page 580
23 UK Gold – page 337
25 NDR – page 660
39 WDR – page 630
43 MDR – page 610
48 SWF-3 – page 525
45 BR – page 382
61 Pro 7 – page 190

That should keep you entertained for a little while – happy viewing! ◆

DrawGen – Part 2

Jim Lesurf

(An apology first of all: The final example program last month included two: dg_open("ram:ooh_er"); and dg_colour("black"); but in all cases, DrawGen commands are in ***upper*** *case, so they should have been DG_open and DG_colour. Sorry about that. Ed.)*

Text and Paths

At the end of the first article on DrawGen, I left you to try a 'C' program which contained some commands which I hadn't explained. You may well have been able to puzzle them out already, but if not, here are the keys to the riddles... Firstly, let's look at producing text.

I have already introduced the command:

```
DG_text(some_text, x_position,
                          y_position);
```

where the first parameter is a text string, and the other two are integers which determine where the bottom-left corner of the displayed text will appear in the drawfile. To accompany this command, there is another:

```
DG_font(font, font_width, font_height,
font_colour);
```

where 'font' is an integer which selects the font to be used, font_width and font_height are also integer values which set the size of the font to print (in 'points'), and font_colour is a string – e.g. "red" – which sets the colour of the font.

To see which fonts !DrawGen is using, open a task-window (press <ctrl-f12>), then type "DrawGen Help", and press <return>. (Note: that *is* the right way around!). If the module is active, this will cause it to print some information. For the version which you can get on the Archive disc (or from the Archive website), this information should read:

```
DrawGen Version 1.22 - 6nd June 1994
(c) Dr. J. C. G. Lesurf

Default linewidth=5 decipoints.
Default text width=12 & height=12 points.
Default line style = 0  8 others defined.
Default font = #1
Resident fonts:
1 = Homerton Medium 2 = Homerton.Medium.
Oblique  3 = Homerton.Bold  4 = Trinity.
Medium   5 = Trinity.Medium.Italic
6 = Trinity.Bold Extra fonts = 3
7 = Corpus.Medium
8 = Corpus.Medium.Oblique
9 = Corpus.Bold
```

In this case, font '5' is Trinity.Medium.Italic, so if we want to write something in this font using characters 20 points wide and 24 points high, in blue, we'd use the command:

```
DG_font(5,20,24,"blue");
```

and then follow this with the appropriate DG_text commands. To see how this works, try the program:

```
/* demo of text drawing 2 */

#include <stdio.h>
#include "DGLib.h"

int main(void)
{dg_open("ram:text2") ;  /* Create the
                                    file */

 DG_text("Hi There!",200,300);  /* Print
          some text in the default font */
 DG_font(5,18,24,"darkblue");   /* Change
              to 'font 5' (Trinity.Medium.
            Oblique), 18 points wide by 24
      points high, coloured dark blue.  */

 DG_text("Now dark blue and new font!",
         200,350); /* Text now coloured */

 DG_font(7,16,16,"red");  /* now red
                     corpus, 16*16 point */
 DG_text("Now in red",200,400);

 DG_make();       /* Tell DrawGen to make
                          the DrawFile  */
 /* That's it! */
}
```

This produces the following drawfile:

You can now use the DG_font/DG_text commands to produce text as and how you wish in your drawfile. What's more, you aren't limited to the fonts shown above. You can add some fonts of your choice to the list that DrawGen knows about. To do this, you have to alter the contents of the !Run file which is inside the !DrawGen application.

Open up !DrawGen by holding down <shift> and double-clicking on its icon with select. Now drag the !Run file and drop it onto your favourite plain text editor. (Edit if you haven't anything better!) This will now show:

```
Set DrawGen$Options -F3 -Dl -L5 -W12 -H12
Set DrawGen$ExFonts Corpus.Medium/Corpus.
                    Medium.Oblique/Corpus.Bold
RMEnsure ABCLibrary 0.01 RMLoad <Obey$Dir>
                                        .ABCLib
RMEnsure ABCLibrary 0.01 Error 0 Requires
                                        ABCLib.
RMload <Obey$Dir>.DrawGenMod
```

The interesting lines here are the first two which 'set' a pair of system variables. The second of these – DrawGen$ExFonts – is a list of the fonts you want to add to the basic ones (the Homerton and Trinity families) which !DrawGen knows about. By default, the extra fonts are just the Corpus family as that's the only one I can feel confident will be on most machines. You can change these if you wish to other fonts which you wish to use. For example, on my machine these lines are normally set to:

```
Set DrawGen$Options -F8 -Dl -L5 -W12 -H12
Set DrawGen$ExFonts Bodoni/Bodoni.Italic/
                    Bodoni.Bold.Italic/MathPhys/
    MathPhys.Italic/LondonA/LondonA.Italic/
                                LondonA.Bold
```

So I'd normally get the Bodoni font when I ask !DrawGen for font 7, and LondonA.Italic when I ask for font 13. To set up your own choices, change the DrawGen$ExFonts string to include the fonts you want, but keep to the following rules:

1) The string can't have any spaces in it, so separate the font names by using '/' slashes as shown above.
2) Use the *exact* names of your fonts.
3) The string must be less than 255 characters long
4) Also change the '-F' item in the DrawGen$Options line.

This final item is because the -F tells !DrawGen how many extra fonts to expect over and above those it always assumes are present. When you get !DrawGen, this will be set to '-F3'. But if you were to make the change to my own font choices, there would now be eight extra fonts, so this item would have to be changed to '-F8'.

While looking at the !Run file, this is perhaps a good time to explain the other options. These are:

-D sets the default font (normally '1' for Homerton medium)

-W sets the default font width in points

-H sets the default font height in points

-L sets the default width of lines (in tenths of a point) used for commands like 'DG_rectangle', etc.

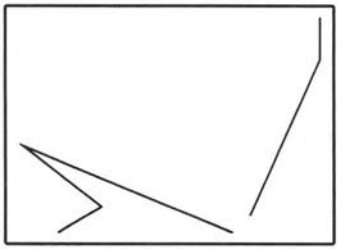
By altering these settings, you can tailor the !DrawGen defaults to suite your needs.

Paths

Having dealt with text in detail, we can now have a close look at how you can draw complex patterns. In the previous article, I showed an easy way to draw simple shapes like rectangles and circles. However, !DrawGen also provides a way to draw almost any shape, using a wide variety of lines. This more powerful level of drawing is based upon a small set of commands which set out to provide access to the drawfile concept of a *path*. The easiest way to understand this is by looking at an example:

```
/* demo of path drawing 1 */

#include <stdio.h>
#include "DGLib.h"

int main(void)
{dg_open("ram:paths1") ;   /* Create the
                                    file */

  DG_path(100,200,5,0,-1); /* Start a path
           at x=100, y=200 (OS units) line
      thickness = 5 tenths of a point line
      colour 0 (i.e. black) fill colour -1
                    (i.e. no filling)  */
  DG_draw(150,230);   /* Draw a bit, just
                  like old Basic 'PLOT' */
  DG_draw(60,300);
  DG_draw(300,200);
  DG_move(320,220);  /* move a bit without
                        drawing anything */
  DG_draw(400,400);  /* Draw a bit more */
  DG_draw(400,450);

  DG_end();      /* End the drawing path */

  DG_make();        /* Tell DrawGen to make
                          the DrawFile  */
}
```

This produces the pattern as shown below.



Although not exactly worthy of Rembrandt, this drawing shows how the path drawing system works. To draw a path, you start with the command:

```
DG_path(x_start, y_start, thickness,
line_colour, fill_colour);
```

This tells DrawGen to start drawing the object or path at the location, x_start, y_start. Both these values are integers in 'OS units'. The remaining three integer values define the line thickness (in tenths of a point), its line colour, and the filling colour (if any). To draw out the actual shape you then use the appropriate mixture of

```
DG_draw(x, y);
```

and

```
DG_move(x, y);
```

commands. These work very much like the DRAW and MOVE commands, as used by Basic to draw on the screen. We essentially draw a line from place to place using the DG_draw command, or use DG_move to move without drawing anything.

To tell !DrawGen we've finished the path, we use the command:

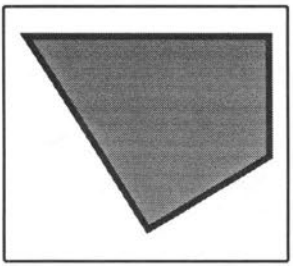
```
DG_end();
```

Unlike the simple commands we've used up until now, the DG_path command gives us detailed control over the colours. To do this, we must use numbers to define the red, green and blue content. For example, try the program:

```
/* demo of path drawing 2 */
#include <stdio.h>
#include "DGLib.h"

int main(void)
{dg_open("ram:paths2") ; /* Create the
                                    file */
```

```
DG_path(100,200,10,0x0000ff00,0x00ff0000);
                /* Start a drawing path at
              x=100, y=200 (OS units) line
      thickness = 10 tenths of a point line
          colour 0x0000ff00 (i.e. red) fill
         colour 0x00ff0000 (i.e. green)  */
 DG_draw(200,200);       /* Draw around the
                                  shape */
 DG_draw(200,150);
 DG_draw(150,120);

 DG_close();     /* close the shape - i.e.
                               fill it */

 DG_end();       /* End the drawing path */


 DG_make();      /* Tell DrawGen to make
                        the DrawFile  */
}
```

This produces the shape shown below – a peculiar shape which shows a red line filled in green.



The colours are defined by the two values, "0x0000ff00" and "0x00ff0000", in the DG_path command. These values follow the internal Acorn standard approach, they are integers in hexadecimal form, "0xbbggrr00", where the "rr" sets the amount of red, the "gg" sets the amount of green, and the "bb" the amount of blue. On this basis, we can now look back at the previous example which created and see that this had a line colour of "0", i.e. of "0x00000000" or "no blue, no green, no red", hence a black line. To get a 'transparent' colour, we use the special value "–1". Using this as the fill colour in the earlier example ensured that no attempt was made to fill the shape. In this newer red/green example, we have specified a green fill. In principle, we can use any colours we like.

When filling in a shape, it is a good idea to use the command

```
DG_close();
```

just before DG_end(). This ensures that the shape is fully closed and the chosen line runs all around the edge.

That's probably enough about drawing complex lines for now, but later we will be able to see how it is possible to draw curved lines, and lines which have dotted/dashed patterns. Before that, however, I'll spend time in the next article explaining how to use !DrawGen from Basic programs. (And about time, too! I hear some of you say!) ◆

Fact-File

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Abacus Training	29 Okus Grove, Upper Stratton, Swindon, Wilts, SN2 6QA. (01793-723347) [01793-723347]
Acorn-by-Post	13 Dennington Road, Wellingborough, Northants, NN8 2BR. (01933-279300)
Acorn Computer Group	645 Newmarket Road, Cambridge, CB5 8PB. (01223-725000) [01223-725100] http://www.acorn.co.uk/
Alsystems	47 Winchester Road, Four Marks, Alton, Hampshire, GU34 5HG. (01420-561111) [01420-561100] <keith@alsys.demon.co.uk>
Anglia Multimedia	Anglia House, Norwich, NR1 3JG. (01603-615151) [01603-622191] www.iats.norfolk.gov.uk/anglia
APDL	39 Knighton Park Road, Sydenham, London, SE26 5RN. (0181-778-2659) [0181-488-0487] <info@apdl.co.uk>
Beebug Ltd	117 Hatfield Road, St Albans, Herts, AL1 4JS. (01727-840303) [01727-860263] <sales@beebug.co.uk>
Calligraph Ltd	53 Panton Street, Cambridge CB2 1HL. (01223-566642) [01223-566643]

Chameleon Assessment Techniques Ltd	Staythorpe, Newark, Notts. NG23 5RQ (01636-646719) [01636-646718]
Cherisha Software	16 Woodside Drive, Wilmington, Dartford, Kent, DA2 7NG. <rebecca@katech.zynet.co.uk>
Clares Micro Supplies	98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. (01606-48511) [01606-48512] <sales@clares.demon.co.uk>
Dinamyx	St. Columba's College, King Harry Lane, St. Albans, AL3 4AW. <http://www.keeffe.demon.co.uk/dinmyx.htm>
Eesox	Suite 8C, Newton House, 147 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (01954-212263) [01954-212263] <eesox@cityscape.co.uk>
EFF	11 Silwood Road, Ascot, SL5 0PY. (01344-875201) [01344-875202] <info@efffonts.demon.co.uk>
ESP	21 Beech Lane, West Hallam, Ilkeston, Derbyshire, DE7 6GP. (0115-944-4140) [0115-944-4150] <sales@exsoftpr.demon.co.uk>
Grasshopper Software	6 Truro Close, East Leake, Loughborough, LE12 6HB.
Hampshire Microtechnology Centre	Connaught Lane, Paulsgrove, Portsmouth, Hants, PO6 4SJ. (01705-378266) [01705-379443] <EDSEIAMT@hantsnet.hants.gov.uk>
IMS	Desktop Laminations, P.O.Box 332, Bristol, BS99 7XL. (01934-522880)
Inclusive Technology	2 Castle Street, Castlefield, Manchester, M3 4LZ. (0161-835-3677) [0161-835-3688]. <roger@inclusive-technology.com> <www.inclusive.co.uk>
Liquid Silicon	FREEPOST EH2725, Kirkcaldy, Fife, KY2 5PN. (01592-592265) <liquid@cableinet.co.uk>
Longman Logotron	124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS. (01223-425558) [01223-425349] <support@logo.com>
NCET	Milburn Hill Road, Science Park, Coventry, CV4 7JJ. (01203-416994) [01203- 411418]
Octopus Systems	9 Randwell Close, Ipswich, IP4 5ES. (01473-728943) [01473-270643] <sales@octosys.co.uk> http://www.octosys.co.uk/
Oregan Developments	36 Grosvenor Avenue, Streetly, Sutton Coldfield, B74 3PE. (0121-353-6044) [0121-353-6472] <sales@oregan.demon.co.uk> <support@oregan.demon.co.uk>
PCD Maltron	15 Orchard Lane, East Molesey, Surrey, KT8 0BN (0181-398-3265)
Quantum Software	35 Pinewood Park, Deans, Livingston, EH54 8NN. (01506-411162) <sales@quantumsoft.co.uk>
Q-Tec Technology Resources	Unit 22, Brougham Enterprise Centre, Brougham Terrace, Hartlepool TS24 8EY. (01429-890800) [01429-890700] <106065.1403@compuserve.com>
RaspSoft	15, Market Street, Wibsey, Bradford, BD6 1LR. <http://www.argonet.co.uk/users/s.dine>
Repair Zone	421 Sprowston Road, Norwich, NR3 4EH. (01603-400477) <rprzone@paston.co.uk>
ServiceTech (warranty service)	0990-134972
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